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This report contains a collection of eleven topic papers on dental insurance and the oral health of Army dependents based on research conducted between 1986-1992. The papers address policy issues related to the Active Duty Dependents Dental Insurance Plan as well as comparisons of oral health measures between military dependents and their civilian cohorts.

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**A Compendium on Dental Insurance and the Oral
Health of Army Dependents**

1986 - 1992

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CONTENTS

Preface	5
SOCIODEMOGRAPHICS, PERCEIVED NEED AND ORAL HEALTH STATUS IN AN INSURED POPULATION	
Michael C. Chisick	
Allyson R. Davies	
Willard G. Manning	
R. Gary Rozier	
Ceia Collins	
Susan Holtby	13
ENROLLMENT CHOICE BETWEEN SPACE-AVAILABLE MILITARY DENTAL CARE AND A HYPOTHETICAL DENTAL INSURANCE PLAN	
Michael C. Chisick	
Richard D. Guerin	39
FACTORS AFFECTING ENROLLMENT CHOICE BETWEEN SPACE AVAILABLE MILITARY DENTAL CARE AND DENTAL INSURANCE BY ARMY SPOUSES	
Michael C. Chisick	
Richard D. Guerin	63
REACTION OF ARMY SPOUSES TO THE ACTIVE DUTY DEPENDENTS DENTAL INSURANCE PLAN	
Michael C. Chisick	
Richard D. Guerin	
Timothy R. Williams	89
REACTION OF ARMY FAMILIES WITH GRADE SCHOOL CHILDREN TO THE ACTIVE DUTY DEPENDENTS' DENTAL INSURANCE PLAN	
Michael C. Chisick	
Richard D. Guerin	
Timothy R. Williams	109
DENTAL UTILIZATION BY SCHOOL AGE DEPENDENTS OF ACTIVE DUTY SOLDIERS	
Michael C. Chisick	
Richard D. Guerin	
Timothy R. Williams	129
DENTAL TREATMENT NEEDS OF SPOUSES OF ACTIVE DUTY ARMY SOLDIERS	
Michael C. Chisick	
Richard D. Guerin	
Timothy R. Williams	143
DENTAL TREATMENT NEEDS OF SCHOOL AGE CHILDREN OF ACTIVE DUTY SOLDIERS	
Michael C. Chisick	
Richard D. Guerin	
Timothy R. Williams	161

PREVALENCE OF CARIES FREE TEETH AND SEALANTS IN SCHOOL AGE DEPENDENT CHILDREN	
Michael C. Chisick	
Richard D. Guerin	
Timothy R. Williams	179
EXPANDING BENEFITS UNDER THE ACTIVE DUTY DEPENDENTS' DENTAL INSURANCE PLAN	
Michael C. Chisick	
Richard D. Guerin	191
MARKETING AND UTILIZATION OF THE ACTIVE DUTY DEPENDENTS' DENTAL INSURANCE PLAN	
Michael C. Chisick	
Jacqueline Mottern	214

PREFACE

In 1985, Congress authorized a major policy change in military dental care by creating a dental insurance plan for dependents of active-duty military personnel. Funding for the dental insurance plan was appropriated in late 1986, and the plan began operation in August 1987.

The Active Duty Dependents' Dental Insurance Plan (ADDDIP) represented a major policy change because prior to its existence, the Department of Defense (DoD) had no formal commitment to providing dental care benefits to military dependents. Prior to the ADDDIP, Title 10 of the United States Code had allowed the individual military services to provide dental care to dependents on a "space available" basis. This policy, dating from the late 1950's, created inconsistent access to dental care for military dependents because the level and mix of space available dental care varied widely across the military services and across assignment locations. Where space available care was available, queues, for even the most basic dental services, were not uncommon. Consequently, many military families experienced limited access to dental care and had to seek some dental services off post at their own expense. Others had to bear the costs of dependent dental care totally out of pocket.

When implementing the DoD dependent dental insurance plan, Congress, as with many policy initiatives, practiced what political scientist Charles Lindblom called "policy incrementalism". In his classic article, "The Science of Muddling Through", Lindblom wrote

that policy-makers tend to favor small or incremental changes over comprehensive change because frequently the consequences of making major policy changes are unclear. Policy-makers are particularly reluctant to make comprehensive change when they are concerned that unintended consequences may result from their actions. In contrast, consequences of smaller or incremental changes are easier to monitor and to adjust if necessary.

Thus, Congress started the ADDDIP piecemeal (with a basic benefits package covering dental examinations, oral prophylaxes, and routine amalgams) rather than with a comprehensive plan. Congress limited the scope of coverage of the original ADDDIP for two reasons. First, initial funding was too limited to provide coverage of more services. Second, Congress was concerned about the viability of the dental insurance plan.

Concern over the plan's potential for non-viability stemmed from optional enrollment. Because enrollment was voluntary instead of mandatory, Congress and military health policy-makers did not know whether military families would enroll in the ADDDIP in sufficient numbers to make it work. With voluntary enrollment, there was considerable risk that the insurer would experience adverse selection in enrollment. That is, only individuals with high risk (bad dental health) would join the insurance plan. Moreover, under voluntary enrollment, once high risk individuals had received treatment, they would have an incentive to quit the plan. Consequently, adverse selection could escalate the cost of the insurance plan because only the highest risk individuals would

remain in the insured pool. High priced premiums, in turn, would discourage future enrollments and would encourage current enrollees to quit. Eventually, the plan would become non-viable.

While it is possible that voluntary membership could result in an insured pool without adverse selection, previous experience with insured groups suggested that such an outcome was unlikely. So, Congress essentially took a risk that adverse selection would not occur and was unwilling to fund a more comprehensive plan until it could be shown that the ADDDIP would attract a large enough, non-adverse, stable population to be viable. To encourage the odds of such an outcome, DoD incorporated the following two features into the plan: 1) All military families were automatically enrolled in the ADDDIP and had to take the initiative to disenroll, and 2) Once enrolled, a service member was not allowed to disenroll for two years.

Congress selected voluntary enrollment for the ADDDIP because the government wished to pay only part (60%) of the dental insurance premium and because it could not mandate enrollment for military dependents. Furthermore, because Congress was not seeking to enroll soldiers but only their dependents, the framework within which Congress and DoD were confined in designing the ADDDIP was atypical from what most employers face when designing employment dental insurance benefits packages.

Typically, government civilian and private sector employers enroll their entire workforce in a dental insurance plan and pay the full premium for their employees. This way the whole group of

employees is enrolled and there is no adverse selection in enrollment. Employers do this because the insurers insist on it. It creates an insured pool in which risk for need of dental treatment is spread over the entire workforce population over time.

In a given population, there will be individuals with high risk and individuals with low risk of dental disease. The risk for a given individual will vary over time. By including all of these people in the insured pool, the cost of paying for the care of high risk individuals is averaged over the pool of high and low risk individuals. This sharing of cost by the entire workforce keeps insurance premiums reasonable.

However, dental insurance coverage of employee dependents in the private sector varies from firm to firm and tends to be related to firm size. At most large firms (1,000 employees or more), employee dependents are automatically covered under the employer's dental insurance plan and pay no premium. By comparison, at some large firms and at many small firms (less than 1,000 employees) that offer dental insurance, employee dependents frequently have the option to join the firm's dental insurance plan but the employee must pay part or all of the premium. Under any circumstance, insured government civilian or private sector employees and their dependents rarely receive dental care free-of-charge. Even though premiums for many employed groups are prepaid, the employees frequently share in the costs of the health care they consume through annual deductibles, copayments, limits on the amount or types of services covered, and so on.

Thus, the key distinction between the circumstances surrounding designing the ADDDIP and other employer sponsored dental insurance plans is that, in the former, Congress and DoD were seeking to cover only dependents whereas in the latter dependents were added to a pool that included all employees in the workforce of a given employer. Granted, Congress could have chosen to pay the full premium for military dependents, however there were several reasons it did not.

The main reason Congress did not want to pay the full premium for dental insurance for military dependents may have been the limited funds it had available for the original program. However, there were other compelling policy reasons as well. Chief among them was the realization that setting a precedent by paying the full premium for dental insurance for military dependents could lead to expectations for equal treatment by government civilian employee dependents. Or it could lead to expectations for full payment of premiums for government employee dependents for other health insurance. Too, to pay the full premium would run counter to the recommendation of many health economists. Health economists reason that beneficiaries should share the cost burden of health insurance because otherwise the impact of price on their decision to utilize health care services is removed and this encourages overutilization.

In short, because enrollment in the Active Duty Dependents' Dental Insurance Plan was voluntary rather than mandatory, both Congress and the insurers were uncertain of its success. Answers

to numerous policy questions about insuring the dental health of military dependents required social policy research to guide informed, policy decision-making.

To provide answers to key policy questions surrounding the ADDDIP, the Army has sponsored four major studies on the Active Duty Dependents' Dental Insurance Plan over the past six years. This compendium consists of eleven short papers, each of which highlights key findings from these studies and places the issue of military dependent dental insurance in an historical context.

The report begins with a study of dental utilization in an insured civilian population. "Sociodemographics, Perceived Need, and Oral Health Status in an Insured Population" is based on data from the RAND Health Insurance Experiment (HIE). The HIE is a landmark in health services research because it is the only randomized, controlled trial of alternative health insurance policies ever completed. Recognizing the lack of reliable data on how consumers would respond to various health insurance models, the HIE was sponsored by the Nixon Administration to clarify policy debate over national health insurance. This particular paper from the HIE compares dental utilization between one group with access to free care to another group which has to make copayments for dental care. This is the same situation military dependents faced with the advent of the ADDDIP when they had to select between space available military dental care versus enrollment in a dental insurance plan.

The next two studies come from a 1986 pilot study of Army family members which explored their reaction to a hypothetical dependent dental insurance plan. At the time this study was fielded, the benefits package of the ADDDIP were unknown. The hypothetical plan tested in the pilot study was more comprehensive and slightly more expensive than the original ADDDIP. Nonetheless, the studies gave some very valuable insights into issues surrounding military dependent dental insurance such as demographic associations with enrollment choice, the potential for adverse selection in enrollment, and variation in enrollment across assignment location.

Following this are six studies from the full-scale Family Member Oral Health Study (FMOHS). The FMOHS was conducted over twelve study sights and collected data from 1987-88. Data collected on this study included the first survey of attitudes and enrollment in the original ADDDIP as well as oral health measures of Army dependents. These papers document a general dissatisfaction with the limited scope of coverage of the ADDDIP and show that the original benefits package falls considerably short of meeting the dental treatment needs of Army dependents. They also show that the oral health status and dental utilization of Army dependent grade school children exceeds national norms.

The final two surveys were conducted in conjunction with the Army Research Institute for the Social and Behavioral Sciences (ARI). These surveys were done to overcome sampling limitations of the pilot study and the FMOHS. A key advantage of ARI surveys is

that they reflect a random, representative sample of Army personnel systemwide, so their results can be generalized to the Army at-large.

"Expanding Benefits Under the Active Duty Dependents' Dental Insurance Plan" comes from the first ARI survey. In addition to exploring enrollment status and reason for enrollment choice, the study asked what benefits respondents wanted to see added to the ADDDIP and how much they were willing to pay for expanded benefits. The study documents support for expanding covered benefits under the ADDDIP.

The second ARI survey, "Marketing and Utilization of the Active Duty Dependents' Dental Insurance Plan", explored the process by which enrollees made their enrollment decision and the extent to which they have made use of ADDDIP benefits. It provides valuable insights into how marketing the plan to military family members might be improved.

It is hoped that this compendium will provide a useful historical perspective on the development of the Active Duty Dependents' Dental Insurance Plan as well as will underscore the importance of social science research in policy development. Future research on this topic is needed. The ADDDIP is at a critical crossroads. Congress has recently authorized a considerable expansion of ADDDIP benefits. It would be useful for policy-makers to know what impact these changes will have on enrollment and disenrollment as well as whether military family members are now more satisfied with dependent dental benefits.

**Sociodemographics, Perceived Need, and Oral
Health Status In an Insured Population**

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The analyses reported herein were supported by grant 5 R01 H50 5123 to the RAND Corp. from the National Center for Health Services Research.

Previous presentation: Data was presented in an oral session at the annual meeting of the International Association for Dental Research, Chicago, Illinois in March 1987. The paper was one of seven finalists in the Hatton Award Competition for Junior Investigators.

ABSTRACT

This study examined whether sociodemographics, perceived need, and oral health status were associated with utilization of dental care by insureds and whether level of cost-sharing (free/pay) had any impact on utilization in subgroups defined by these characteristics. The data came from 3360 enrollees in the RAND Health Insurance Experiment, a randomized controlled trial of health insurance policies. On the pay plan, the relationship between sociodemographics and dental utilization resembled that found in earlier studies of other insured groups. On the free plan, there continued to be a direct relationship between education and utilization, but the gradient between lower and upper education levels was less. The relationships between income and utilization and between age and utilization was virtually flat. Non-users, regardless of plan, were more likely to be nonwhite. Free care resulted in gains in utilization across nearly all sociodemographic groups. Especially pronounced increases were seen for children younger than 5 years old, women, nonwhites, low-income groups, and low-education groups. Free care also induced higher utilization regardless of perceived need or initial oral health status. However, the increase was greater for those who perceived a need for care or were not in good oral health.

INTRODUCTION

While the literature on dental services utilization is extensive, few studies address insured or prepaid populations. Most investigations of insured or prepaid care studied unrepresentative or self-selected populations. Often, studies were retrospective in design, had unreliable measures of use, and had no detail about the extent of insurance coverage or enrollee demographics. The oral health status of non-users in an insured population has never been investigated.

A lack of reliable information on the impact of dental insurance on utilization led the federal government to fund a national, randomized, multi-year, controlled trial of alternative health insurance policies. This trial, which eventually became known as the RAND Health Insurance Experiment (HIE), was carefully designed to overcome the limitations of previous studies so that it could provide estimates of the effects of cost-sharing for a general, non-aged population.

The purpose of this study was to identify whether sociodemographic characteristics, perceived need, and oral health status were associated with utilization of dental care by insured individuals and whether level of cost-sharing (free versus pay) had any impact on the probability of use in subgroups defined by these characteristics. The data came from the RAND Health, Insurance Experiment. Several papers have been published on the results of the HIE in both dentistry and medicine (1-15).

METHODS

Sample -- The sample, a random 60% of enrollees who had received an oral examination upon entrance to the study, included 3,360 individuals between the age of 3 and 61 years who were eligible for insurance benefits during the entire first year of the HIE. Because certain variables were not collected on all enrollees, the sample size varied depending on the variable under investigation. The variables (and sample sizes) were as follows: all sociodemographics excluding race (3360), race (3332), perceived need (1968), and oral health status (2834)

The HIE studied families in six geographic locations (Dayton, OH; Seattle, WA; Georgetown County, SC; Charleston, SC; ; Franklin County, MA; and Fitchburg, MA) between 1974 and 1982. At each location, families were chosen at random from the civilian non-institutionalized population. Families in the upper 1% of income (\$57,000, 1984 dollars) were not eligible for enrollment. Eligible families were allocated by a variant of stratified random assignment into one of five experimental insurance plans with different levels of cost sharing (16).

Insurance plans. -- The five plans included the following coinsurance rates (percent paid out-of-pocket): 0% (free care), 25%, 50%, 95%, and an individual deductible plan which attached a 95% coinsurance rate with a \$150 per individual (\$450 maximum per family) deductible to outpatient services but provided free inpatient care. In the plans that required some cost sharing, a ceiling was placed on the family's out-of-pocket liability. An annual

maximum dollar expenditure (MDE) was set at 5%, 10%, or 15% of family income or \$1,000, whichever was less. Beyond the MDE, the insurance plan reimbursed all expenses in full.

All insurance plans covered the same scope of dental services. With the exception of fixed orthodontic appliances, all common dental procedures were covered. There were no limits on the number of dental services that a patient could receive. Any treatment plan exceeding \$500 required prior authorization. Patients were free to select their own dentists.

In this study, the plans were collapsed into two groups--a free plan and all other coinsurance plans combined, i.e. the pay plans. The pay plans were combined because Manning et al. (5) observed that a significant difference in annual utilization of dental services in the HIE occurred between the free plan and plans with any coinsurance.

Measurement -- Sociodemographic characteristics (i.e. number of years of education of the female head of household --or if unavailable, of the male head of household, age, gender, race, and family income) and perceived need for teeth cleaning (for dentate enrollees over age 13) were collected from self-administered enrollment medical history questionnaires. Oral health measures were assessed at enrollment by trained examiners using Russell's Periodontal Index (17), DMFT 28 or deft Index (18), and the Simplified Oral Hygiene Index (19). While caries and oral hygiene status were assessed for all enrollees, periodontal status was assessed only for enrollees over age 12. No radiographs were used.

Intra-examiner reliability for DMFT or deft scores was tested for 2% of the sample. Correlations between the first and second scores exceeded 0.95.

Using the oral health measures, enrollees were classified as being in reasonably good oral health or in need of care by applying the following criteria: edentulous individuals who wore dentures, dentate individuals who were caries-free (DMFT/deft= 0) and had good periodontal health (no calculus and no periodontal index tooth score greater than 2), and partially edentulous individuals who wore an upper or lower denture and were caries-free and had good periodontal health were defined as having reasonably good oral health. Those not meeting any of these criteria were considered to be in need of care. Since periodontal status was not assessed for enrollees age 12 or less, they were excluded from this classification.

Insurance claims filed by enrollees were used to determine utilization. Users were those who filed at least one dental claim during the first year of the HIE. Non-users were enrollees who filed no claim during the first year of the study.

Data Analysis -- Because all analyses involved comparing proportions, the Chi-square statistic was the test of choice. All statistical tests were two-tailed. The 95% confidence level was used.

RESULTS

Table 1 presents sociodemographic characteristics and the distribution of enrollment in the insurance plans by the study sample. Tables 2 and 3 give the sociodemographic characteristics of users and non-users of dental care on the pay and the free insurance plans, respectively. With the exception of sex on the pay plan, all within plan comparisons are significant.

For enrollees on the pay plan, there appears to be a direct relationship between income and utilization as well as between education and utilization. Age roughly shows an inverse U-shaped pattern with use, with 6-14 year olds having the highest utilization rate. Whites utilize dental services more than non-whites. Children less than five, non-whites, those with less than 12 years of education, and those in the lower two income brackets are more likely to be non-users of dental care.

Just as with the pay plan, there appears to be a direct relationship between education and utilization on the free plan. However, the gradient is much less pronounced between the lower two and the upper two education levels. Moreover, due to marked increases in utilization by the three lowest income brackets, a direct relationship between income and utilization does not exist on the free plan. Income and age display virtually flat patterns with use; whites utilize dental services more than non-whites; and females utilize dental services slightly more than males. Only non-whites tend to be non-users.

Between plan comparisons of sociodemographics of users and non-users are presented in Table 4. All but two between plan comparisons are significant. The availability of free care enhances utilization by all groups except those in the \$26,100 to \$32,500 income bracket and those with greater than 16 years of education. Of special note is the dramatic increase in utilization by children less than age 5, low income, low education, and non-white groups. The availability of free care results in a near doubling of utilization by enrollees in the lowest income bracket.

Tables 5 and 6 present the initial oral health status of users and non-users on the pay and free plan, respectively. Initial oral health status appears to impact on the decision to seek dental care on the pay plan. On the pay plan, enrollees initially in good oral health are twice as likely to be users than non-users, whereas those initially in need of care, are evenly split between users and non-users (Table 5). In contrast, initial oral health status does not appear to differentially affect utilization on the free plan. Regardless of initial oral health status, enrollees on the free plan were three times as likely to be users than non-users (Table 6).

Table 7 compares the initial oral health status and probability of use between the pay and free plans. Enrollees on the free plan use dental services significantly more than those on the pay plan regardless of initial oral health status.

Tables 8 and 9 present the perceived need for care of users and non-users on the pay and free plans, respectively. Perceived

need appears to influence the use of dental services on the pay plan but not on the free plan. Pay plan enrollees who perceived a need for dental care were as likely to be users as non-users, compared to twice as likely to be users than non-users among those who did not perceive a need for care (Table 8). In contrast, free plan enrollees, regardless of perceived need, were three times as likely to be users than non-users (Table 9). Table 10 demonstrates that free plan enrollees use dental care significantly more than pay plan enrollees regardless of perceived need for care. ,

DISCUSSION

This study has access to a sample of families who were randomly assigned to different cost-sharing dental insurance plans. Major limitations of this study include: a tendency to underclassify decay and periodontal disease due to a lack of radiographs, a tendency to overstate good oral health status due to a classification scheme that did not capture needs for certain prosthetic services (e.g. bridges or partial dentures, and would categorize individuals with such requirements as being in in good oral health), and the use of stratified analysis instead of multiple regression.

A major finding of this study is that two different distributions of sociodemographic characteristics are associated with the probability of use of dental services in the HIE. On the pay plan, the sociodemographics of users and non-users resembles that found in earlier studies of other insured groups. That is, there is a

direct relationship between education and utilization and between income and utilization; age shows an inverse U-shaped pattern with use; and whites use dental services more than nonwhites (20-33, 4, 5). However, the distribution of sociodemographics on the free plan differs in that age and income display virtually flat patterns with use.

Another major finding is that free care is a very potent factor associated with the use of dental services. Compared to some copayment, 0% copayment resulted in gains in utilization levels across nearly all sociodemographic characteristics and regardless of initial oral health status or perceived need for care. Especially pronounced increases in utilization were seen in children 3 to 5 years of age, females, non-whites, and low income and low education groups. Moreover, increases in utilization were greater among those initially not in good oral health and those with a perceived need for care.

The impact of dental insurance on utilization by preschool children is particularly impressive. Compared to recent national survey data, utilization rates by all age groups, except those less than 5 years of age, on the pay plan are roughly comparable to national norms (34). The annual utilization rate by children less than 5 is only 14.3% nationally as compared with 43% in the HIE pay plan. On the free plan, utilization rates by preschoolers jumped to 71.4%. This is quite striking in light of the fact that, nationally, nearly 75% of children under the age of 6 have never seen a dentist (35).

Despite a sizable increase in utilization on the free versus the pay plan, a majority of non-whites remain as non-users. Race is the only sociodemographic variable on the free plan not to register a proportion greater than 50%. It may be helpful to control race when analyzing other factors related to utilization in this dataset in order to detect possible clues to explain the lower utilization levels found among non-whites.

The finding that lower income groups markedly increase their utilization rates in response to the availability of free care substantiates a finding from an earlier analysis of HIE data (5).

This study also challenges the relationship reported in the literature of education and utilization. Although still direct, this relationship is substantially weakened when free care is available owing to the strong gains in utilization by lower education groups relative to upper groups. Hence, free care lessens the gradient in dental utilization between high and low education groups.

Curiously, despite evidence from other studies suggesting that a majority of non-attenders cite lack of need as a reason for not going to the dentist (36, 37, 21) and that perceived need is the most important positive predictor of dental utilization in general (38), in the HIE perceived need appeared to have little impact on the decision to seek care. Only a third or less of HIE enrollees who perceived no need for care are non-attenders. Perhaps this reflects a difference in what was measured. In the HIE, perceived need is related to preventive care, whereas in earlier studies,

perceived need reflects upon dental care in general. Nonetheless, in the HIE free care appears to induce more of those who thought they needed care into seeking care.

With regard to enrollment oral health status, free care appears to induce higher utilization among both those in good oral health and those in need of care. However, the increase in utilization is greater for those who are in need of care.

As for the high levels of utilization by those already in good oral health, this study is not adequately designed to determine whether this represents overutilization. Due to a lack of radiographs at the enrollment oral exam, the extent of decay and periodontal disease may be underestimated. Furthermore, no attempt is made to assess the need for bridgework or partial dentures. In addition, because this study focuses on a measure of utilization that deals with the likelihood of making at least one dental visit within a year's time, no information on the nature or intensity of dental visits is provided. It may be that those in good oral health who utilize dental services are seeking routine examinations and preventive services rather than overutilizing. Cross-tabulations on the intensity and mix of dental services with initial oral health status could provide more insight into the issue of overutilization.

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TABLE 1
SOCIODEMOGRAPHIC CHARACTERISTICS
OF THE STUDY SAMPLE

Variable	Percent of Study Sample
AGE	
3-5 yrs.	5.3
6-14 yrs.	24.6
15-24 yrs.	20.4
25-44 yrs.	21.2
45-62 yrs.	28.5
SEX	
Male	48.1
Female	51.9
RACE	
White	83.6
Non-white	16.4
INCOME	
< \$13,660	20.0
\$13,661- \$20,050	20.0
\$20,050- \$26,100	19.4
\$26,101- \$32,500	20.6
\$32,501 +	20.0
EDUCATION	
< 12 yrs.	28.1
12 yrs.	40.3
13 to 15 yrs.	17.7
16 yrs. +	13.9
INSURANCE PLAN	
Pay	55.0
Free	45.0

TABLE 2

UTILIZATION STATUS BY SOCIODEMOGRAPHICS FOR
PAY PLAN ENROLLEES

Sociodemographics	Sample size	User (%)	Utilization Status Non-user (%)	χ^2	(df)
<u>AGE</u>					
3-5 yrs.	100	43.0	57.0		
6-14 yrs.	463	62.4	37.6		
15-24 yrs.	371	50.7	49.3		
25-44 yrs.	371	54.7	45.3		
45-64 yrs.	543	54.3	45.7		
Total	1848			19.0	(4)*
<u>SEX</u>					
Male	870	57.4	42.6		
Female	978	53.1	46.9		
Total	1848			3.4	(1)
<u>RACE</u>					
White	1477	62.8	37.2		
Non-white	363	23.7	76.3		
Total	1840			180.4	(1)*
<u>INCOME#</u>					
< \$13,660	381	36.0	64.0		
\$13,661- \$20,050	374	47.3	52.7		
\$20,051- \$26,100	382	59.4	40.6		
\$26,101- \$32,500	384	64.1	35.9		
\$32,501 +	327	70.6	29.4		
Total	1848			112.8	(4)*
<u>EDUCATION</u>					
< 12 yrs.	536	37.7	62.3		
12 yrs.	729	55.0	45.0		
13- 15 yrs.	326	69.0	31.0		
16 yrs. +	257	73.9	26.1		
Total	1848			128.1	(3)*

* P <= 0.05, two-tailed test

income in 1983 dollars

TABLE 3
UTILIZATION STATUS BY SOCIODEMOGRAPHICS FOR
FREE PLAN ENROLLEES

Sociodemographics	Sample size	User (%)	Non-user (%)	χ^2 (df)
<u>AGE</u>				
3-5 yrs.	77	71.4	28.6	
6-14 yrs.	362	79.0	21.0	
15-24 yrs.	317	72.9	27.1	
25-44 yrs.	340	75.9	24.1	
45-64 yrs.	416	64.9	35.1	
Total	1512			21.8 (4)*
<u>SEX</u>				
Male	745	69.8	30.2	
Female	767	75.6	24.4	
Total	1512			6.5 (1)*
<u>RACE</u>				
White	1308	76.3	23.7	
Non-white	184	46.7	53.3	
Total	1492			71.0 (1)*
<u>INCOME#</u>				
< \$13,660	291	71.1	28.9	
\$13,661- \$20,050	298	66.4	33.6	
\$20,051- \$26,100	271	77.1	22.9	
\$26,101- \$32,500	307	69.4	30.6	
\$32,501 +	345	79.1	20.9	
Total	1512			17.8 (4)*
<u>EDUCATION</u>				
< 12 yrs.	409	62.1	37.9	
12 yrs.	624	74.7	25.3	
13- 15 yrs.	268	80.6	19.4	
16 yrs. +	211	77.7	22.3	
Total	1512			35.5 (3)*

* P <= 0.05, two-tailed test

income in 1983 dollars

TABLE 4
UTILIZATION STATUS BY INSURANCE PLAN
AND BY SOCIODEMOGRAPHICS

Sociodemo graphics	Sample size	Utilization Status		Sample size	Insur. Pay (%)	Plan Free (%)	2 X (df)
		User	Non-user				
AGE							
3-5 yrs.	98	43.0	71.4	79	57.0	28.6	14.2 (1)*
6-14 yrs.	575	62.4	79.0	250	37.6	21.0	26.5 (1)*
15-24 yrs.	419	50.7	72.9	269	49.3	27.1	35.4 (1)*
25-44 yrs.	461	54.7	75.9	250	45.3	24.1	34.9 (1)*
45-64 yrs.	565	54.3	64.9	394	45.7	35.1	10.9 (1)*
Total	2118			1242			
SEX							
Male	1019	57.4	69.8	596	42.6	30.2	26.7 (1)*
Female	1099	53.1	75.6	646	46.9	24.4	93.8 (1)*
Total	2118			1242			
RACE							
White	1926	62.8	76.3	859	37.2	23.7	59.0 (1)*
Non-white	172	23.7	46.7	375	76.3	53.3	30.1 (1)*
Total	2098			1234			
INCOME							
< \$13,660	344	36.0	71.1	328	64.0	28.9	81.7 (1)*
\$13,661- \$20,050	375	47.3	66.4	297	52.7	33.6	25.6 (1)*
\$20,051- \$26,100	436	59.4	77.1	217	40.6	22.9	22.4 (1)*
\$26,101- \$32,500	459	64.1	69.4	232	35.9	30.6	2.2 (1)
\$32,501 +	504	70.6	79.1	168	29.4	20.9	6.5 (1)*
Total	2118			1242			
EDUCATION							
< 12 yrs.	456	37.7	62.1	489	62.3	37.9	55.4 (1)*
12 yrs.	867	55.0	74.7	486	45.0	25.3	56.5 (1)*
13- 15 yrs.	441	69.0	80.6	153	31.0	19.4	10.3 (1)*
16 yrs. +	354	73.9	77.7	114	26.1	22.3	0.9 (1)
Total	2118			1242			

* P <= 0.05, two-tailed test
income in 1983 dollars

TABLE 5
UTILIZATION STATUS BY INITIAL ORAL HEALTH
STATUS FOR PAY PLAN ENROLLEES

Initial Oral Health Status	Sample size	<u>Utilization Status</u>		χ^2 (df)
		User (n=852) (%)	Non-user (n=692) (%)	
Good	376	65.4	34.6	
Need Care	1168	51.9	48.1	
Total	1544			21.1 (1)*

* P <= 0.05, two-tailed test

TABLE 6
UTILIZATION STATUS BY INITIAL ORAL HEALTH
STATUS FOR FREE PLAN ENROLLEES

Initial Oral Health Status	Sample size	<u>Utilization Status</u>		χ^2	(df)
		User (n=936) (%)	Non-user (n=354) (%)		
Good	302	74.5	25.5		
Need Care	988	72.0	28.0		
Total	1290			0.75 (1)	

TABLE 7

UTILIZATION STATUS BY INSURANCE PLAN
AND BY INITIAL ORAL HEALTH STATUS

Initial Oral Health Status	Sample size	<u>Utilization Status</u>				<u>Non-user</u>				2	
		User		Insurance Plan		Non-user		Insurance Plan			
		PAY (%)	FREE (%)	(n=852)	(n=936)	Sample size (%)	PAY (%)	FREE (%)	(n=354)		
Good	471	65.4	74.5			207	34.6	25.5		6.51 (1)*	
Need Care	1317	51.9	72.0			839	48.1	28.0		90.8 (1)*	
Total	1788					1046					

* P <= 0.05, two-tailed test

TABLE 8
UTILIZATION STATUS BY PERCEIVED NEED
FOR PAY PLAN ENROLLEES

Perceived Need size	Sample	<u>Utilization Status</u>		χ^2	(df)
		User (n=613) (%)	Non-user (n=458) (%)		
Yes	644	52.0	48.0		
No	407	65.9	34.1		
Total	1071			19.1	(1)*

* P <= 0.05, two-tailed test

TABLE 9
UTILIZATION STATUS BY PERCEIVED NEED
FOR FREE PLAN ENROLLEES

Perceived Need	Sample size	<u>Utilization Status</u>		2	X	(df)
		User (n=658) (%)	Non-user (n=239) (%)			
Yes	584	72.8	27.2			
No	313	74.4	25.6			
Total	897			0.29	(1)	

TABLE 10
UTILIZATION STATUS BY INSURANCE
PLAN AND BY PERCEIVED NEED

Perceived Need	Sample size	<u>Utilization Status</u>				χ^2	(df)		
		<u>User</u>		<u>Non-user</u>					
		Insurance Plan PAY (n=613) (%)	FREE (n=658) (%)	Insurance Plan PAY (n=458) (%)	FREE (n=239) (%)				
Yes	770	52.0	72.8	478	48.0	27.2	57.0 (1)*		
No	501	65.9	74.4	219	34.1	25.6	6.17 (1)*		
Total	1271			697					

* P <= 0.05, two-tailed test

Enrollment Choice Between Space-Available
Military Dental Care and a Hypothetical
Dental Insurance Plan

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key words : dental insurance, dental dual choice, Active Duty Dependents' Dental Insurance Plan, space available military dental care, dental utilization.

Disclaimer:

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ABSTRACT

Prior to implementation of the Active Duty Dependents Dental Insurance Plan in August 1987, military health policy makers had little understanding how Army families would respond to dental insurance. In this 1986 pilot study, 728 parents of school-age children (K-12) of active duty soldiers at 2 Army installations were surveyed to determine whether they would select a hypothetical, voluntary, dental insurance plan over space available dental care in military dental clinics. Treatment needs of the children were assessed by a dentist without the use of radiographs. Treatment needs were compared to enrollment choice to test for adverse selection. Results show 22.9% overall support for the plan. Support is low across demographic characteristics, treatment need levels, utilization, and source of dental care. Nearly two-thirds or more of most groups reject the plan. Family size is the only study variable to show statistically significant variation with enrollment choice. Families having more than 2 children are less supportive of the plan than smaller families. Evidence of adverse selection is suggested. These results suggest that the hypothetical dental insurance plan would attract a low level of enrollment and would be a poor incentive for recruitment and retention of career soldiers.

INTRODUCTION

Many studies and reviews have addressed factors influencing the enrollment decision between prepaid group medical plans and conventional health insurance (1-20). In the literature, such situations are referred to as "dual choice". In 1985 when Congress authorized the Department of Defense (DoD) to develop a voluntary dental insurance plan for dependents of active duty military personnel (21), it created a dental dual choice situation for military families. (Congress withheld funding for a year to allow DoD to design the insurance plan. The Active Duty Dependents Dental Insurance Plan did not become operative until August 1987). Military families would now be able to choose between seeking dental care on a space available basis in military dental clinics or from private sector dentists with DoD dental insurance. (Space available care refers to care provided to family members in military treatment facilities after duty mission requirements are met.)

How Army family members would respond to dental dual choice was unknown but of keen interest to several parties. Insurers and makers of military health policy wanted to know whether the dental insurance plan would attract high enrollment and have broad cross-sectional appeal to military families from all ranks. Also of concern was adverse selection. That is, would only those with high levels of dental treatment needs enroll in the plan? Commanders of Army dental clinics and civilian dental practitioners near military installations wanted to know how the plan would impact on their

operations. What proportion of Army dependents seeking space available care in military clinics would now opt for dental care in the civilian sector? What intensity and mix of dental services would they require?

To provide makers of military health policy with guidance on these issues, the Dental Studies Division, U.S. Army Health Care Studies and Clinical Investigation Activity, conducted a pilot study on dependents of active duty soldiers. We could identify no literature where factors associated with enrollment choice in a dual choice context for dental care has been investigated. Because results from previous medical dual choice studies are mixed, we decided to examine many of the factors investigated in these studies, such as demographic characteristics, past utilization, and health risk, in a dental dual choice context. The dental treatment needs of Army family members were surveyed and their attitudes toward a hypothetical dental insurance plan were assessed. The purpose of this paper is to describe how the parents of school-age children (K-12) reacted to the hypothetical insurance plan and how certain factors associated with that decision. These factors include demographic characteristics (age and race of the child, family size, rank of sponsor, and assignment location), intensity, mix, and severity of the child's dental treatment needs, past dental utilization of the child, and the child's source of dental care (military or civilian). Results from a companion study of 789 Army spouses are presented in another paper.

MATERIALS AND METHODS

Sample

Two study sites were selected: Ft. Knox and Ft. Campbell, Kentucky. These posts were selected because they had large on-post schools that were willing to participate in the study. School-age children in grades K-12 enrolled in on-post schools comprised the sampling frame. Five to ten students per classroom were randomly chosen for inclusion in the survey. A total of 728 children examined. The data were collected over a four week period (2-31 September 1986).

Measurement

Age, sex, and race of each child was noted by the examiner. Family size, rank of sponsor, past dental utilization, and source of dental care (military and/ or civilian) of the child, and attitude of the child's parents toward a hypothetical dental insurance plan were collected from self-administered questionnaires attached to parental consent slips.

Study participants received a comprehensive oral examination by a non-calibrated military dental officer. There was one examination officer at each study site. Dental treatment needs--restorations, replacements, and extractions--were visually assessed with a mirror and a dental explorer. Radiographs were not used. Examiners then assessed the severity of need for dental treatment of each patient and assigned them to one of three categories as follows:

none - no restorations, replacements, or extractions needed

routine - routine dental care needed

emergent - at least one tooth has the potential to develop a dental emergency within the next 12 months if left untreated.

Using findings from the oral examinations, we determined intensity and mix of dental treatment needs. Intensity of dental treatment needs was determined by counting the number of teeth per patient requiring restorations, replacements, or extractions and classifying a patient into one of four categories:

zero - no teeth have treatment needs

low - 1 to 3 teeth have treatment needs

moderate - 4 to 6 teeth have treatment needs

high - 7 or more teeth have treatment needs.

Mix of dental treatment needs was based on the type of dental services required per patient. There were three categories of mix, and they were defined as:

none - no teeth required restorations, replacements, or extractions;

simple - one or more teeth required only 1, 2, or 3 surface restorations or simple extractions; or

complex - one or more teeth required 4 or 5 surface restorations, stainless steel crowns, or removable partial dentures.

When the study was designed, details of the structure of the Active Duty Dependents Dental Insurance Plan were not final. Using guidelines released by The Army Times, a hypothetical dental

insurance plan was constructed. Attitudes of the child's parents were assessed with the question: "Would you join an insurance plan costing \$10 a month per family member which would pay for 80% of the cost of cleaning and restorative care such as caps and fillings?"(22) The cost of the hypothetical plan tested in this study is slightly less than Schoen's's estimate of \$11.11 a month per family member (adjusted for inflation from 1975 to 1986 dollars) for a comprehensive dental care program (23). It is also within the range of premium estimates (\$8.10 to \$20 a month per family member) for a benefits package similar to the hypothetical plan quoted to us by two major dental insurance companies.

Data Analysis

Completed survey forms were screened and edited Health Care Studies and Clinical Investigation Activity (HCSCIA) and were entered onto a computer tape through a contract monitored by the Health Care Systems Support Activity. Data analysis was performed by the Dental Studies Division, HCSCIA, using the Statistical Analysis System (SAS). Significance testing was done at the 95% confidence level using the Chi-square test.

RESULTS

Table 1 presents demographic characteristics of the sample. The majority of the sample is white, between 7-16 years of age, have sponsors of middle (E4-E6) or senior (E7-E9) enlisted rank, and come from families with 2 or more children. The sample is

evenly split by sex and assignment location.

Overall, barely one-fifth (22.9%) of the children's parents favor the hypothetical dental insurance plan. Table 2 shows the distribution of attitude toward the plan by demographic characteristics. Every demographic variable registers a low level of support for the plan ranging from 20.7% to 37.7%. Least supportive are families with 3 or more children. Most supportive are families with senior officer (04-06) sponsors. Family size is the only demographic variable to show a statistically significant variation with enrollment choice. Support for the plan declines as families increase in size beyond 2 children. Assignment location approaches statistical significance with families at Ft. Knox being more in favor of the plan than those at Ft. Campbell.

Although not statistically significant, age and rank of sponsor display notable patterns of association with enrollment choice. Attitude by age group shows an undulating pattern. Starting with over a third of the parents of 5-6 year olds favoring the plan, approval drops to roughly one-fifth for the parents of 7-12 year olds. Approval begins to rise among parents with teenagers, peaking at nearly a third for parents of 15-16 year olds. It then falls to about 28% of 17-19 year olds. Senior officers distinctively stand out as favoring the plan (37.7% when compared to other rank groups (about 25%).

The relationships between attitude of the child's parents and intensity, mix, or severity of dental treatment needs of the child are presented in table 3. Although none of these relationships are

statistically significant, a similar trend appears in two of them. There appears to be a direct relationship between mix and severity of dental treatment needs and favorable attitudes toward the hypothetical dental insurance plan. From roughly one-quarter in favor at the low end of these indices, about one-third are in favor at the high end.

Table 4 shows the relationship between attitude of the child's parent toward the hypothetical dental insurance plan and dental utilization behavior and source of dental care of the child. With the exception of parents whose child has never visited a dentist, the relationship between attitude and utilization is virtually flat. Nearly a third of parents whose child has never seen a dentist are in favor of dental insurance versus roughly one-fifth of other utilization groups. Parents whose child has seen civilian dentists only are more in favor of dental insurance (41.5%) than parents whose child has seen military dentists only (24.5%) or both military and civilian dentists (26.8%).

Dental utilization by school-age children of active duty soldiers is high. Only 5.4% of the study sample have never seen a dentist; 78.0% have seen a dentist within the past year. These children are much more likely to have seen a military dentist than a civilian one. While only 5.6% of the study sample has never been to a military dentist, 81.2% have never been to a civilian dentist.

DISCUSSION

This study has several limitations. First, it is unknown whether the sample is representative of Army family members with school-age children. Since demographic characteristics of the sampling frame are unavailable, it is unknown how the sampling frame and sample compare. Only children attending schools on post were sampled. Families with school-age children attending schools off post may hold different attitudes toward dental insurance. Moreover, the study was conducted at two Army installations that historically have provided high levels of dental care to military families. Satisfaction with the access of families to military dental care may be unusually high at these posts resulting in a low level of approval for dental insurance. At installations providing lower levels of dental care to family members, more favorable attitudes toward dental insurance may be present.

Second, the sampling method did not control for multiple children families. It is possible that more than one child from a family was included in the study. Where this occurred, attitudes of the parents of these children were assessed more than once.

Third, the results of this study pertain only to a hypothetical insurance plan. Since DoD had not announced details of the Active Duty Dependents Dental Insurance Plan when this study was designed, a hypothetical plan was constructed by the investigators. The plan tested in this survey and the plan DoD implemented in August 1987 differ in cost, coverage, and restrictions. The actual plan is less expensive and covers fewer

services than the hypothetical plan. Thus, attitudes toward the actual plan might differ from those found in this survey.

Fourth, the child's age and treatment needs are only part of the family's evaluation of its enrollment choice. The age and treatment needs of the other dependents not included in the sample may have influenced the decision.

Fifth, the small size of several subgroups in the analyses contributed to large standard deviations and unstable estimates for several variables. This, in turn, made testing difficult for significant differences within distributions of subgroups. Finally, since radiographs were not used, treatment needs may be underestimated.

A major finding of this study is that the hypothetical dental insurance plan suffers a low level of support and has narrow cross-sectional appeal to Army families with school-age children. Overall, only 22.9% of the study sample favor the plan. Nearly two-thirds or more of most demographic groups reject the plan. The particularly strong rejection of the hypothetical plan by all rank groups suggests that this plan would be a poor recruitment and retention tool for career soldiers and their families. That families with senior officer sponsors (04-06) are more in favor of the plan than other ranks may be due to more disposable income and higher education levels in these families. Family income has been reported to be a significant factor in nearly all medical dual choice studies (17,9,12,13,18). Only a few have found it not to be significant (15,17,19). Education, too, has been noted to be

significantly associated with most medical dual choice situations (1,5,7,11,15,16,18). Few studies have found it not to be significant (4,9,17,19).

The finding that support for the hypothetical plan drops as the number of children in a family grows indicates that family size is a major factor in this dental dual choice setting. This is consistent with findings from some medical dual choice studies (1,4,11,18), but inconsistent with others (4,7,13,15,20). Most likely, the fixed cost per enrollee in the hypothetical plan (\$10 a month per person) explains this trend. Policy analysts who designed the Active Duty Dependents Dental Insurance Plan foresaw this problem and established a cost ceiling to the plan (\$7.86 a month per family with one or more children).

The fall, rise, and then fall pattern in the distribution of enrollment choice and age suggests that parents may be making their decision using expectations of dental disease in their child, value judgments about the worth of permanent versus primary teeth, and a crude cost-benefit calculus. The caries prevalence in permanent teeth of adolescents may be of greater concern to parents than caries in the primary teeth of younger children and may lead parents to enroll their families in dental insurance. Parents of older teenagers may feel that the benefit of dental insurance would be available for too limited a time to justify the cost. Several medical dual choice studies have found significant associations between age and the enrollment decision (1,2,11,18). Others have found no association (4,7,12,15,20).

Regardless of study site, the majority of the study sample was against the hypothetical dental insurance plan. This is not surprising in light of the history of these two installations providing high levels of space-available dental care to military family members. The high dental utilization rate and the preference for military dentists found in this sample suggests a high level of access to space-available dental care at Ft. Knox and Ft. Campbell. Apparently, where sufficient levels of dental care are provided to family members by military clinics, Army families are satisfied with the status quo or they view the alternative as too costly.

Although intensity, mix, and severity of dental treatment does not appear to appreciably affect the decision to enroll in the hypothetical dental insurance plan, some trends in the data (mix and severity) suggest adverse selection may be occurring. Yet data on intensity of dental treatment needs provides contrary evidence. These findings must be interpreted with caution. Owing to the small number of cases on the higher end of these indices, these findings may not be stable. In other words, had more cases in these categories been included in the sample, their distributions might have been different from what was observed. Hence, the evidence for adverse selection in this sample is not firm.

Evidence of adverse selection with regard to health status from medical dual choice studies is neither clear nor consistent. Unlike this study in which dental treatment needs were assessed in a dental examination by a dentist, medical dual choice studies relied on self-reported (perceived) measures of health status. Some

medical dual choice investigators found contradictory evidence for adverse selection within their study samples (7,14,15,18). Others found no support for adverse selection with regard to health status (4,9,11,13,16).

Neither dental utilization nor source of care appear to play a significant role in the insurance enrollment decision. Clearly, most of these children are seeking care in military dental clinics. Of the over 80% of children who have never been to a civilian dentist, three-quarters of their parents reject the hypothetical plan. This suggests a high level of satisfaction with family dental care at military clinics among families who routinely seek care there. Contact with a civilian dentist does not appreciably change the attitude of Army families toward care in military dental clinics. Nearly three-quarters of parents whose child has been to both military and civilian dental clinics reject the hypothetical plan. Lack of contact with a military dentist, however, tends to lessen opposition to dental insurance. Forty percent of parents whose child had seen a civilian dentist only favor dental insurance. Medical dual choice studies are split as to whether past utilization is (12,14,16,18) or is not (9,11,13,20) associated with enrollment choice. The dental utilization rate found in this sample of 5-19 year olds (78.0%) exceeds that found for 5-17 year olds in the 1986 National Health Survey (70.3%) (24).

Compared with the companion study of 789 Army spouses at 5 military installations (Ft. Carson, Colorado; Ft. Leonard Wood, Missouri; Ft. Polk, Louisiana; Ft. Riley, Kansas; and Ft. Sill,

Oklahoma), some striking differences appear. The companion study shows a higher level of support for the plan (58%) plus widespread support across most sociodemographics characteristics. As in this study, family size has an inverse and significant relationship with enrollment choice. Yet support for the plan for families with 3 or more children in the spouse study is more than double (47.7%) compared with this study (20.7%). Among spouses, no evidence of adverse selection exists. The dental utilization rate of spouses (60.6%) is much lower than for school-age children (78.0%).

Such a wide discrepancy in attitudes between the two studies is perplexing. It is not due to differences in rank structure of the two samples. Even when rank is controlled for, differences between the two groups persist. This suggests to us that level of access to space-available military dental care (as determined by assignment location) plays a major role in the enrollment decision. The context in which the questionnaires were completed by the two study groups may also have contributed to the differences in attitudes. Parents of school-age children completed their questionnaires at home where they may have reflected on positive experiences in seeking dental care for their children. Spouses, on the other hand, completed their questionnaires while waiting for routine dental care in military dental clinics. Their responses may have been influenced by less positive experiences in seeking care for themselves.

CONCLUSION

It is important to note that the present study deals with a particular practice context. Caution must be applied when comparing these results with studies from other practice settings. An important distinction between this and most medical dual choice studies is what constitutes the status quo. In all but three of the previous studies (1-3), conventional health insurance is the status quo and a prepaid group plan is the innovative option. In the context of this study of dental dual choice, the converse is true. A free group dental plan (albeit space available and varying in scope of services provided from one location to another) is the status quo. Conventional dental insurance is the innovative option. Another important difference is that this study is predictive rather than explanatory. It deals with a hypothetical choice situation rather than a choice that has already been made. Whether respondents would actually do what they claim is subject to dispute. Results from this study suggest that a DoD sponsored dental insurance plan for families of active duty Army personnel would not be popular among military families with school-age children at certain installations. The particularly strong rejection of the hypothetical plan by all ranks in this study suggests that this plan would be a poor recruitment and retention tool for career soldiers and their families at installations where access to space available dental care for school-age children in military clinics is high. Results suggest that adverse selection in enrollment might occur at such installations. Due to the low

level of dental disease present in the sample, this matter deserves further investigation. However, results from the companion study of spouses suggests that the hypothetical dental insurance plan would be attractive at other installations. Family size appears to be major influence on the enrollment decision regardless of access level to space available dental care. Whether these findings would apply to the Active Duty Dependents Dental Insurance Plan that was activated in August 1987 is unknown. This question is under investigation.

According to CHAMPUS, 52% of eligible Army sponsors are enrolled in the Active Duty Dependents Dental Insurance Plan. The reaction of Army families to the hypothetical plan is important in light of recent reports about declining enrollment in the actual plan (25,26). Benefit limitations have been cited as leading reasons for dissatisfaction with the plan. Expanding benefits of the Active Duty Dependents Dental Insurance Plan would most likely include raising the premium. If benefits of the existing plan were expanded to cover comprehensive restorative services, the cost of the new plan may approach that of the hypothetical plan tested in this study. The cost to Army families of a revised dental insurance plan, of course, would depend on how much of the premium the Federal government chooses to subsidize.

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TABLE 1
 DEMOGRAPHIC CHARACTERISTICS
 of the SAMPLE
 (n= 728)

Variable	Study Sample (%)
<u>AGE</u> (in years)	
5-6	8.0%
7-8	15.7%
9-10	20.5%
11-12	20.1%
13-14	15.2%
15-16	15.1%
17-19	5.5%
<u>SEX</u>	
Male	50.0%
Female	50.0%
<u>RACE</u>	
White	63.7%
Black	25.4%
Other	10.9%
<u>FAMILY SIZE</u>	
1 Child	10.8%
2 Children	44.1%
3+ Children	45.1%
<u>RANK of SPONSOR</u>	
E4-E6	46.8%
E7-E9	32.8%
W1-W3	7.3%
O1-O3	3.6%
O4-O6	9.5%
<u>ASSIGNMENT LOCATION</u>	
Ft. Knox	50.3%
Ft. Campbell	49.7%

TABLE 2

ATTITUDE TOWARD the HYPOTHETICAL DENTAL INSURANCE PLAN
by DEMOGRAPHIC CHARACTERISTICS

<u>AGE</u>	n	Percent in favor	SD	χ^2	df	prob.
5-6 yrs.	58	34.5%	6.2			
7-8 yrs.	114	22.8%	3.9			
9-10 yrs.	149	20.8%	3.3			
11-12 yrs.	146	22.6%	3.5			
13-14 yrs.	111	28.8%	4.3			
15-16 yrs.	110	32.7%	4.5			
17-19 yrs.	40	27.5%	7.1	8.84	6	0.183

RACE

White	464	24.1%	2.0			
Black	185	30.8%	3.4			
Other	79	25.3%	4.9	3.08	2	0.214

RANK of SPONSOR

E4-E6	341	25.8%	2.4			
E7-E9	239	23.0%	2.7			
W1-W4	53	24.5%	5.9			
O1-03	26	26.9%	8.7			
04-06	69	37.7%	5.8	6.09	4	0.193

FAMILY SIZE

1 Child	79	29.1%	5.1			
2 Children	321	30.5%	2.6			
3+ Children	328	20.7%	2.2	8.56	2	0.014*

STUDY SITE

Ft. Knox	366	29.0%	2.4			
Ft. Campbell	362	22.9%	2.2	3.45	1	0.063

* significant at $p < 0.05$

TABLE 3
 ATTITUDE TOWARD the HYPOTHETICAL DENTAL INSURANCE PLAN
 by INTENSITY, NIX, and SEVERITY of NEED for DENTAL CARE

<u>Intensity of Need</u>	n	Percent in Favor	SD	χ^2	df	prob.
zero (0 teeth)	610	24.9%	1.8			
low (1-3 teeth)	104	32.7%	4.6			
moderate-high (4+ teeth)	14	21.4%	11.0	2.95	2	0.229
<u>Mix of Services</u>						
none	610	24.9%	1.8			
simple	97	29.9%	4.6			
complex	21	38.1%	10.6	2.74	2	0.255
<u>Severity of Need</u>						
none	610	24.9%	1.8			
routine or emergent	112	31.3%	4.4	1.98	1	0.160

TABLE 4

ATTITUDE TOWARD the HYPOTHETICAL DENTAL INSURANCE PLAN
by UTILIZATION BEHAVIOR (any dentist) and SOURCE of CARE

<u>Dental Utilization</u>	n	Percent in Favor	SD	χ^2	df	prob.
past 12 mo.	568	20.5%	1.7			
1+ yrs.	120	23.3%	3.9			
never	40	30.0%	7.2	0.792	2	0.673
<u>Source of Care</u>						
military only	591	24.5%	1.8			
civilian only	41	41.5%	7.7			
both	56	26.8%	5.9			
neither	40	30.0%	7.2	6.11	3	0.106

**Factors Affecting Enrollment Choice Between
Space Available Military Dental Care and
Dental Insurance By Army Spouses**

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**key words: dental insurance, dental dual choice, enrollment choice
in dental insurance, Army spouses, demographics and dental
insurance enrollment, Active Duty Dependents' Dental Insurance
Plan, space available military dental care**

Disclaimer:

The opinions or assertions contained herein are the private ones of the authors and are not to be construed as official or as reflecting the views of the U.S. Army or Department of Defense.

ABSTRACT

Prior to implementation of the Active Duty Dependents Dental Insurance Plan, military health policy makers had little understanding how Army families would respond to dental insurance. In this 1986 pilot study, 789 spouses of active duty soldiers at five Army installations were surveyed to determine whether they would select a hypothetical, voluntary, dental insurance plan over space available dental care in military dental clinics. Results show a high level (58%) of support for the plan plus widespread support across most sociodemographic characteristics. Education level, race, family size, and assignment location have significant influence on the enrollment decision. In families with children, an inverse relationship between support for the plan and family size exists. Whites are more supportive of dental insurance than blacks or other ethnic groups. Age, rank of sponsor, number of years a military spouse, location of domicile (on or off post), dental treatment needs, past dental utilization, and source of dental care (military versus civilian) do not show statistically significant associations with enrollment choice.

INTRODUCTION

This paper is a companion to the immediately preceding article "Enrollment Choice Between Space-Available Military Dental Care and a Hypothetical Dental Insurance Plan". Its purpose is to describe how Army spouses reacted to the hypothetical insurance plan and how certain factors associated with that decision. These factors include demographic characteristics, intensity, mix, and severity of dental treatment needs, and past dental utilization.

MATERIALS AND METHODS

Sample

Five study sites were selected: Ft. Sill, Oklahoma; Ft. Riley, Kansas; Ft. Leonard Wood, Missouri; Ft. Polk, Louisiana; and Ft. Carson, Colorado. These posts were selected because they have large dependent populations. Convenience sampling was employed. The sampling frame included all spouses of active duty Army personnel who, on their own volition, reported for dental examinations at dental clinics chosen for the study. Adults who were undergoing routine treatment or who were seeking emergency care were excluded from the survey in order to avoid bias toward under- or over-estimating treatment needs. Spouses who, themselves, were active duty soldiers were also excluded from the sample as they are eligible for routine care at military dental clinics. The data were collected over a nine week period (2 September to 31 October 1986).

Measurement

Sociodemographic data (age, sex, race, and education of the study participant as well as rank of sponsor) were collected from each patient by the examiner. Rank is a unique military demographic variable. It is a composite of occupational status, educational level, length of military service, and income. There are two broad classes of rank, enlisted and officer, which correspond in the civilian sector to blue-collar and white-collar workers, respectively. Officers must have a college degree. Many attain graduate degrees. Enlisted soldiers have no educational requirement. Most of them have high school diplomas. Within each class of rank, higher rank means higher income. Family size, number of years as a military spouse, assignment location, domicile location (on or off post), past dental utilization (any dentist), source of dental care (military and/or civilian), and attitude toward a hypothetical dental insurance plan were collected from self-administered patient questionnaires.

Study participants received a comprehensive oral examination by a military dental officer. Dental treatment needs--restorations, replacements, and extractions-- were visually assessed with a mirror and a dental explorer. Radiographs were not used. Examiners then assessed the severity of need for dental treatment of each patient and assigned them to one of three categories as follows:

none - no restorations, replacements, or extractions needed
routine - routine dental care needed

emergent - at least one tooth has the potential to develop a dental emergency within the next 12 months if left untreated.

Using findings from the oral examinations, we determined intensity and mix of dental treatment needs. Intensity of dental treatment needs was determined by counting the number of teeth per patient requiring restorations, replacements, or extractions and classifying a patient into one of four categories:

zero - no teeth have treatment needs

low - 1 to 3 teeth have treatment needs

moderate - 4 to 6 teeth have treatment needs

high - 7 or more teeth have treatment needs.

Mix of dental treatment needs was based on the type of dental services required per patient. There were three categories of mix, and they were defined as:

none - no teeth required restorations, replacements, or extractions;

simple - one or more teeth required only 1, 2, or 3 surface restorations or simple extractions; or

complex - one or more teeth required 4 or 5 surface restorations, cast restorations, bridges, removable partial dentures, or complicated extractions.

At the time of the study, details of the structure of the Department of Defense (DoD) Dependent Dental Insurance Plan were unknown. Using guidelines given in the Defense Authorization Act of 1986, a hypothetical dental insurance plan was constructed. Attitudes of Army spouses were assessed with the question: "Would

you join an insurance plan costing \$10 a month per family member which would pay for 80% of the cost of cleaning and restorative care such as caps and fillings?"(22)

Data Analysis

Completed survey forms were screened and edited Health Care Studies and Clinical Investigation Activity (HCSCIA) and were entered onto a computer tape through a contract monitored by the Health Care Systems Support Activity. Data analysis was performed by the Dental Studies Division, HCSCIA, using the Statistical Analysis System (SAS). Significance testing was done at the 95% confidence level using the Chi-square test.

RESULTS

Table 1 compares selected demographic characteristics between the study sample and the population of Army spouses. Population figures were provided by the U.S. Army Community and Family Support Center. (23-24) Few notable differences exist. The sample has slightly more spouses (4% or more) age 24 or less, white, having some college and with sponsors of rank O1-O3. It has fewer (4% or more) spouses over age 35 and non-white/non-black. The majority of the sample are white females between 25- 34 years of age, having completed high school or some college, and having spouses of enlisted rank.

Table 2 presents the distribution of the study sample by assignment location. Over half of the sample is drawn from Ft.

Polk, Louisiana or Ft. Leonard Wood, Missouri.

Overall, 58% of spouses are in favor of the hypothetical dental insurance plan. Table 3 shows the distribution of attitude toward the plan by sociodemographic characteristics. The distribution of attitude by sex is not included because the sample is virtually all female.

Race and education are the only sociodemographic variables to show statistically significant relationships with the enrollment decision. A majority of whites and blacks support the proposed dental insurance plan. Whites are more in favor of the plan than expected and blacks are less supportive. Spouses with a graduate degree and some high school were more supportive of the plan than spouses with high school diplomas, some college, or college degrees. Spouses from other ethnic groups and spouses with less than high school educations are the only sociodemographic groups to register a majority against the plan.

The relationship between age and attitude approaches significance. For most age groups, acceptance is near the overall expected value of 58%. There is a significant departure from expected acceptance among 30-39 year olds.

Examining attitude by rank of sponsor reveals two distinct and opposite trends. As one moves from junior (E1-E3) to senior (E7-E9) enlisted ranks, support for the hypothetical dental insurance plan increases. However, as one moves from junior (O1-O3) to senior (O4-O6) officer ranks, support for the plan decreases. Spouses of warrant officers hold attitudes that are

similar to those of spouses of senior enlisted personnel. These differences, however, are not statistically significant.

In table 4, attitude by family and residence characteristics are given. Attitude shows an inverse U-shaped pattern with family size. This distribution is statistically significant. A majority of childless couples are in favor of the insurance plan. Having one child increases favorableness toward the plan. However, as family size expands beyond one child, attitudes in favor of the plan drop. If childless couples are excluded, there is an inverse relationship between family size and attitudes toward the hypothetical dental insurance plan. A majority of larger families (3 or more children) are opposed to the plan.

Attitude by the length of time as a military spouse approaches statistical significance and shows a sigmoid pattern. Regardless of the length of time a spouse belonged to a military household, attitudes toward the dental insurance plan remain favorable. Spouses in military households 7-12 years are least in favor of the plan (53%), while those in military households 18 or more years are most in favor (69.9%).

Enrollment choice is not independent of assignment location but is independent of domicile location (on or off post). Of the five study sites, only Ft. Sill has a majority of spouses opposed to the plan, however this is by a margin of less than 1%. At Ft. Polk and Ft. Leonard Wood, about 54% of spouses are in favor of the plan. Nearly three-quarters of spouses at Ft. Carson and Ft. Riley favor dental insurance. Regardless of whether they live on or off

post, the majority of spouses favor dental insurance. Spouses living on post are slightly more in favor than spouses living off post.

Regardless of level of intensity, mix, or severity of dental treatment needs, a majority of spouses favor the hypothetical dental insurance plan (Table 5). Attitude toward the hypothetical dental insurance plan is consistent (58% in favor) across all levels of intensity of need for dental care. Spouses requiring a complex mix of services are only slightly (2%) more in favor of dental insurance than spouses requiring no treatment. Likewise, spouses having at least one tooth with potential to cause a dental emergency (emergent) are only slightly (3%) more in favor of dental insurance than spouses requiring no dental care. None of the variations in these distributions are significant statistically.

Table 6 shows the relationships between attitude toward the hypothetical dental insurance plan and dental utilization behavior and source of care (military or civilian). The former distribution approaches significance. There is an inverse relationship between attitude toward the plan and length of time since last dental visit. However, only spouses who never or last saw a dentist more than five years ago register a majority opinion against the plan. With the exception of spouses who had seen neither a military nor a civilian dentist, a majority of spouses favor the hypothetical insurance plan. The distribution is not statistically significant.

Dental utilization by Army spouses in the survey sample is high. Over two-thirds (67.6%) had seen a dentist within the past

year. Despite the unavailability of dental insurance through the Army, 16% of spouses in this survey had seen a civilian dentist within the past year.

DISCUSSION

This study has several limitations. First, even though the sample appears to be representative of the population of Army spouses, the sampling strategy excluded spouses who did not utilize military dental clinics. By limiting the sample this way, a selection bias may have been introduced. Spouses voluntarily seeking dental examinations in military clinics may have different attitudes toward dental insurance than spouses who prefer to be treated by non-military dentists or those who avoid routine visits to any dentist.

Second, the results of this study pertain only to a hypothetical insurance plan. Since DoD had not announced details of the Active Duty Dependents Dental Insurance Plan when this study was designed, a hypothetical plan was constructed by the investigators. The plan tested in this survey and the plan DoD implemented in August 1987 differ in cost, coverage, and restrictions. The DoD plan is less expensive and covers fewer services than the hypothetical plan. Thus, attitudes toward the DoD plan might differ from those found in this survey.

Finally, survey questionnaires may not have been completed by the key decision-maker on health care issues in the family. In this survey, questionnaires were completed by spouses. Spouses and their

military sponsors may hold different opinions on family health care matters. In the dental insurance plan that DoD implemented, the military sponsor's endorsement is necessary to change enrollment status in the plan. Thus, the attitude of the military sponsor may be a better indicator of whether or not a military family would enroll in a hypothetical dental insurance plan.

A major finding of this study is that dental insurance enjoys a high level and a wide cross-section of support among Army spouses. Overall, 58% of spouses favor the hypothetical insurance plan. Only spouses with no high school education, 3 or more children, and non-white/non-black ethnic groups register a majority opinion against it. Spouses most in favor of the plan tend to be white, 35-39 year olds with one child, 18 or more years as a military spouse, and married to a senior non-commissioned officer or warrant officer. This profile of traits suggests that spouses of senior ranking personnel with small families are likely to prefer dental insurance. This may reflect a later stage in the family life cycle as well as higher disposable income in such families. Perhaps attitudes in some of these groups were influenced by anticipation of continued enrollment in the insurance plan after retirement from the military. Had the hypothetical plan been restricted to families of active duty military personnel, i.e. excluded retirees, support for the plan might have been less within older age groups, more senior enlisted ranks, and those with lengthier times as Army spouses.

The finding that support for the hypothetical plan drops as the number of children in a family grows indicates that family size is a major factor in this dental dual choice setting. This is consistent with findings from some medical dual choice studies (1,4,11,18). It is inconsistent with others which found no association between enrollment and family size (4,7,13,15,20). Most likely, the fixed cost per enrollee in the hypothetical plan (\$10 a month per person) explains this trend. Policy analysts who designed the Dependent Dental Insurance Plan foresaw this problem and established a cost ceiling to the plan (\$7.86 a month per family with one or more children).

The lack of support for the dental insurance plan among non-white/non-black ethnic groups raises several questions-- who are they, why do they oppose the plan, and is this effect consistent across study sites. Knowing whether the non-white/non-black ethnics are Hispanic, Asian, or native American might provide some clues. Perhaps their opposition to the hypothetical plan may be due to an access barrier such as limited English skills. Or perhaps these families face economic or discrimination barriers in seeking dental care outside of the military health system. Analyzing enrollment decision by site (data not shown), we find that choice is not dependent on race at two (Colorado and Oklahoma) of the five study sites. Results from medical dual choice studies with regard to race are ambiguous. Bashshur and Metzner (19) found that blacks favored prepaid group practice over conventional health insurance. Welch and Frank (4) found no difference in preference by race.

This study also found that attitudes toward dental insurance vary widely from one post to another. Of the five installations selected for this study, one has a slight majority of spouses against the plan, two have slight majorities in favor of the plan, and two have solid majorities in favor of the plan. This suggests that assignment location has a major influence on attitudes toward dental insurance. This is probably due to differences in access to family member dental care in military clinics at each post. Military family members receive a wide range of routine dental care at some Army posts and only limited care at others.

There is little difference between the proportion of spouses living off post and those living on post who are in favor of the dental insurance plan. This finding suggests that proximity to military dental clinics is not a factor in the dental dual choice decision. This is in agreement with some medical dual choice studies (7,13), but not with others (6,12,15,18). Many spouses living on post apparently are willing to seek dental care off post in the civilian economy.

A particularly notable finding is that intensity, mix, and severity of dental treatment required does not appreciably affect enrollment choice. This finding suggests that adverse selection would not occur in this population. Thus, restrictions such as mandatory enrollment periods, typically seen in group dental insurance plans, may not be necessary with Army spouses.

Evidence of adverse selection with regard to health status from medical dual choice studies is neither clear nor consistent.

Unlike this study in which dental treatment needs were assessed in a dental examination by a dentist, medical dual choice studies relied on self-reported (perceived) measures of health status. Some medical dual choice investigators found contradictory evidence for adverse selection within their study samples (7, 14,15,18). Others found no support for adverse selection with regard to health status (4,9,11,13,16).

Past dental utilization does not play a significant role in the enrollment decision. Highly favorable attitudes toward dental insurance by spouses who regularly seek dental care as well as by spouses who had not seen a dentist in up to five years suggest that spouses may be, in some way, dissatisfied with space available military dental care. Perhaps this reflects long queues for care, limited services available for dependents, lack of a single care provider, lack of a consistent range of available services from one Army post to another, or perceptions of quality of care in military dental clinics. Medical dual choice studies are evenly split as to whether past utilization is (12,14,16,18) or is not (9,11,13,20) associated with enrollment choice.

The trends present in the distributions of enrollment choice and age and number of years as a military spouse both approach significance. The rise, fall, and then rise patterns suggest that these variables are closely associated with the family life cycle. Young couples without children and older couples with fully grown children may have more disposable income and therefore be more attracted to dental insurance. In contrast, middle-aged couples

with children may have less disposable income and therefore be more attracted to group practice dental care. Several medical dual choice studies have found significant associations between age and the enrollment decision (1,2,11,18). Others have found no association (4,7,12,15,20).

Another major finding from this study is that a majority of all rank groups are in favor of the hypothetical dental insurance plan and there is no significant difference between rank groups. Dental insurance appears to be an attractive incentive for both recruitment and retention of soldiers.

The significant association between education level and the enrollment choice found in this study has also been noted in medical dual choice situations (1,5,7,11,15,16,18). However, it has been found not to have a significant association in other medical dual choice studies (4,9,17,19).

It is important to note that the present study deals with a particular practice context. Caution must be applied when comparing these results with studies from other practice settings. An important distinction between this and most medical dual choice studies is what constitutes the status quo. In all but three of the previous studies (1-3), conventional health insurance is the status quo and a prepaid group plan is the innovative option. In the context of this study of dental dual choice, the converse is true. A free group dental plan (albeit space available and varying in scope of services provided from one location to another) is the status quo. Conventional dental insurance is the innovative

option. Another important difference is that this study is predictive rather than explanatory. It deals with a hypothetical choice situation rather than a choice that has already been made. Whether respondents would actually do what they say they would do is subject to question.

CONCLUSION

Results from this study suggest that a DoD sponsored dental insurance plan for spouses of active duty Army personnel would experience a high level and broad cross-section of enrollment. Because of its appeal across all ranks, dental insurance appears to be an attractive recruitment and retention incentive. However, the specific plan tested in this pilot study would not be attractive to servicemen with large families or families in the early stage of the life cycle. Adverse selection with regard to dental treatment needs would occur. Living on post would not deter Army spouses from seeking dental care in the civilian sector. Whether the same level of support exists for the DoD Dependent Dental Insurance Plan that was activated in August 1987 as was found for the hypothetical plan in this survey is unknown. Also unknown is why Army spouses held the opinions they did. These issues are under investigation.

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TABLE 1

Comparison of Selected Demographic Characteristics of the Study Sample and the Population of Army Spouses

Variable	Study Sample (n= 789)	Population (N= 335,515)
<u>AGE</u>		
24 or less yrs.	34.3 %	29.1 %
25-34 yrs.	46.6 %	47.7 %
35 + yrs.	19.0 %	23.2 %
<u>SEX</u>		
Male	0.6 %	2.5 %
Female	99.4 %	97.5 %
<u>RACE</u>		
White	70.2 %	64.9 %
Black	19.0 %	17.9 %
Other	10.8 %	17.2 %
<u>EDUCATION</u>		
less than high school	9.5 %	9.7 %
high school graduate	45.0 %	47.1 %
some college	35.2 %	28.4 %
college graduate	8.0 %	8.9 %
beyond college	2.3 %	5.8 %
<u>RANK of SPONSOR</u>		
E1-E4	27.9 %	26.4 %
E5-E6	34.6 %	38.6 %
E7-E9	18.9 %	16.8 %
W1-W4	3.0 %	3.3 %
O1-O3	11.0 %	7.4 %
O4-O6	4.4 %	7.5 %
<u>Family Size</u>		
0 children	25.3 %	23.0 %
1 child	24.8 %	26.0 %
2 children	33.4 %	33.0 %
3 + children	16.2 %	18.0 %

TABLE 2
Distribution of Study Sample By Assignment Location

<u>Assignment Location</u>	<u>Study Sample</u>
Ft. Carson, Colorado	12.0%
Ft. Leonard Wood, Missouri	20.0%
Ft. Polk, Louisiana	40.2%
Ft. Riley, Kansas	13.3%
Ft. Sill, Oklahoma	14.4%

TABLE 3

ATTITUDE TOWARD the HYPOTHETICAL DENTAL INSURANCE PLAN
by SOCIODEMOGRAPHIC CHARACTERISTICS

<u>AGE</u>	n	Percent in Favor		SD	χ^2	df	prob.
16-20 yrs.	95	61.1%	5.0				
21-24 yrs.	176	57.4%	3.7				
25-29 yrs.	202	56.9%	3.5				
30-34 yrs.	166	50.6%	3.9				
35-39 yrs.	97	70.1%	4.6				
40+ yrs.	53	60.4%	6.7	10.2		5	0.070 a
<u>RACE</u>							
White	554	62.1%	2.1				
Black	150	51.3%	4.1				
Other	85	43.5%	5.4	13.9		2	0.001 b
<u>EDUCATION</u>							
No high school	9	22.2%	13.9				
Some high school	66	71.2%	5.6				
G.E.D.	23	65.2%	9.9				
High school grad	332	57.5%	2.7				
Some college	278	54.7%	3.0				
College grad	63	58.7%	6.2				
Graduate degree	18	77.8%	9.8	14.2		6	0.028 b
<u>RANK of SPONSOR</u>							
E1-E3	74	58.1%	5.7				
E4-E6	419	54.9%	2.4				
E7-E9	150	66.7%	3.8				
W1-W4	24	66.7%	9.6				
O1-O3	87	58.6%	5.3				
O4-O6	35	51.4%	8.4	7.66		5	0.176

a- approaching significance at $p < 0.05$ b- significant at $p < 0.05$

TABLE 4

ATTITUDE TOWARD the HYPOTHETICAL DENTAL INSURANCE PLAN
by FAMILY and RESIDENCE CHARACTERISTICS

<u>FAMILY</u> <u>SIZE</u>	n	Percent in Favor	SD	χ^2	df	prob.
0 Children	200	57.5%	3.5			
1 Child	196	64.8%	3.4			
2 Children	265	58.5%	3.0			
3+ Children	128	47.7%	4.4	9.39	3	0.025 a
<u># YEARS A</u>						
<u>MILITARY</u>						
<u>SPOUSE</u>						
0-3 years	296	55.1%	2.9			
4-6 years	136	61.8%	4.2			
7-12 years	166	53.0%	3.9			
13-17 years	98	59.2%	5.0			
18+ years	93	69.9%	4.8	8.99	4	0.061 b
<u>ASSIGNMENT</u>						
<u>LOCATION</u>						
Ft. Carson	95	71.6%	4.6			
Ft. L. Wood	158	54.4%	4.0			
Ft. Polk	317	53.9%	2.8			
Ft. Riley	105	73.3%	4.3			
Ft. Sill	114	49.1%	4.7	24.0	4	0.000 a
<u>DOMICILE LOCATION</u>						
Off post	473	56.7%	2.3			
On post	316	60.1%	2.8	0.94	1	0.334

a- significant at $p < 0.05$ b- approaching significance at $p < 0.05$

TABLE 5

ATTITUDE TOWARD the HYPOTHETICAL DENTAL INSURANCE PLAN
by INTENSITY, MIX, and SEVERITY of NEED for DENTAL CARE

<u>Intensity</u> <u>of Need</u>	n	Percent in Favor	SD	χ^2	df	prob.
zero (0 teeth)	140	57.9%	4.2			
low (1-3 teeth)	294	57.8%	2.9			
moderate (4-6 teeth)	159	58.5%	3.9			
high (7+ teeth)	196	58.2%	3.5	0.02	3	0.999
<hr/>						
<u>Mix</u> <u>of Services</u>						
none	140	57.9%	4.2			
simple	245	55.5%	3.2			
complex	404	59.6%	2.4	1.08	2	0.583
<hr/>						
<u>Severity</u> <u>of Need</u>						
none	140	57.9%	4.2			
routine	527	57.3%	2.2			
emergent	141	61.5%	4.1	0.71	2	0.701

TABLE 6

ATTITUDE TOWARD the HYPOTHETICAL DENTAL INSURANCE PLAN
by UTILIZATION BEHAVIOR (any dentist) and SOURCE of CARE

<u>Dental Utilization</u>	n	Percent in Favor	SD	χ^2	df	prob.
past 12 mo.	533	60.6%	2.1			
1-2 yrs.	128	56.3%	4.4			
3-5 yrs.	88	53.4%	5.3			
>5 yrs.	29	41.4%	9.1			
never	11	36.4%	14.5	7.81	4	0.099 a
<u>Source of Care</u>						
military only	109	56.0%	4.8			
civilian only	179	55.9%	3.7			
both	490	59.8%	2.2			
neither	11	36.4%	14.5	3.28	3	0.350

a- approaching significance at $p < 0.05$

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**Reaction of Army Spouses to the
Active Duty Dependents Dental Insurance Plan**

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Key Words: dental insurance, Army spouses, Active Duty Dependents
Dental Insurance Plan, enrollment, reaction

Disclaimer: The opinions or assertions contained herein are the private ones of the authors and are not to be construed as official or as reflecting the views of the U.S. Army or the Department of Defense.

Abstract

This study examines the reaction of 3,556 Army spouses to the Active Duty Dependents Dental Insurance Plan (ADDDIP). We collected data on self-administered questionnaires at ten posts throughout the United States from August 1987 to March 1988. Results show that access to space available military dental care influences enrollment choice and attitudes toward the plan. Further, enrollment status and willingness to pay for expanded benefits demonstrate strong associations with attitudes toward the ADDDIP. Insufficient scope of coverage is the chief complaint about the ADDDIP. Overall, half of our sample claim they are willing to pay extra for improved benefits.

Introduction

When the Active Duty Dependents Dental Insurance Plan (ADDDIP) was launched in August 1987, Congress and the Department of Defense hailed it as a long overdue alternative for dependents to limited space available care in military dental clinics. However, the response of Army families to the plan was not as enthusiastic. Figures from the Office of the Civilian Health and Medical Plan of the Uniformed Services, which monitors enrollment, show that initially only 48% of insurance eligible Army families stayed in the ADDDIP. Since enrollment in the ADDDIP was automatic, families wishing to disenroll had to take the initiative to do so. Despite this administrative burden, a majority of Army families elected to decline coverage. Moreover, when initial enrollment obligations expired, enrollment dropped precipitously (1,2). In searching for explanations for the plan's lack of appeal, advocates of the dependent dental plan blamed poor marketing, and Congress directed the Secretary of Defense to investigate whether "this problem is a result of inadequate marketing or if situations exist that would actually discourage enrollment" (3).

As part of a detailed examination of the dental treatment needs of Army family members, we surveyed the attitudes of spouses to the dependents dental insurance plan. We conducted our survey shortly after the ADDDIP was initiated. To our knowledge, our survey is the first report of how Army families reacted to the plan. Although our survey did not address marketing issues, we believe it offers valuable insights into why the ADDDIP experienced

low enrollment among Army families.

Methods

This study, completed by the Dental Studies Division, U.S. Army Health Care Studies and Clinical Investigation Activity, collected data on enrollment of Army families in the Active Duty Dependents Dental Insurance Plan and their attitudes toward the plan. The survey was a part of a larger study of the oral health status of dependents of active duty Army personnel. We collected data from August 1987 to March 1988 on 3,556 spouses at ten Army posts (Ft. Richardson, Alaska; Hawaii; Ft. Ord, California; Ft. Lewis, Washington; Ft. Benning, Georgia; Ft. Hood, Texas; Ft. Bliss, Texas; Ft. Belvoir, Virginia; Ft. Gordon, Georgia; and Ft. Campbell, Kentucky). We selected sites with differing costs of living and differing levels of space available dental care because we believed these factors might influence enrollment choice. To identify installations with different levels of dependent (space available) dental care, we first determined the percent of total output of dental services being provided to dependents at all posts in Health Services Command (HSC). Next, we rank ordered the list and divided it into thirds. Installations were then classified as follows:

Below HSC Average - provide dependent dental care in the lower third of all HSC posts,

At HSC Average - provide levels of dependent dental care in the middle third of all HSC posts, and

Above HSC Average - provide levels of dependent dental care in the upper third of all HSC posts.

We determined that Ft. Ord, Hawaii, Ft. Lewis, and Ft. Belvoir rank below HSC average; Ft. Campbell and Ft. Gordon rank at the HSC average; and Ft. Hood, Ft. Bliss, Ft. Benning, and Ft. Richardson rank above the HSC average.

Two sampling strategies were employed. Initially, we randomly selected spouses at each study site by keying off the terminal digit in their military sponsor's social security number using the Standard Installation and Division Personnel Eligibility Reporting System (SIDPERS). However, owing to a poor response rate (8-20%), we switched to clinic based convenience sampling. That is, we asked spouses reporting to military dental clinics to participate in the study.

We asked spouses to complete a 28-item self-administered questionnaire. Six questions focused on the Active Duty Dependents Dental Insurance Plan. Following a brief description of the plan, we asked:

- 1) Do you think this plan is a gain or loss of benefits for military family members? (Gain or Loss response).

- 2) Will this insurance plan meet the dental treatment needs of your family? (Yes or No response).

- 3) Do you plan to stay in the Active Duty Dependents Dental Insurance Plan? (Yes or No response).

4) Please give the most important reason why you quit the Active Duty Dependents Dental Insurance Plan.

- a) The monthly membership costs too much.
- b) My having to pay 20% of the costs for fillings is too much.
- c) I prefer to get care at a military dental clinic.
- d) Family member care is easy to get on this post.
- e) The plan does not cover enough services.
- f) My family will be moving overseas soon.
- g) The cost of dental care off post is too high even with insurance.
- h) Filing insurance claims is too much trouble.
- i) Other (please specify).

5) Please give the most important reason why you stayed in the Active Duty Dependents Dental Insurance Plan.

- a) Too long a wait for care at military dental clinics.
- b) I prefer to be treated by civilian rather than military dentists.
- c) Military dental clinics give only a few services to dependents.
- d) My family lives so far from post that it would be easier to go to a civilian dentist.
- e) Other (please specify).

6) Would you be willing to pay a higher monthly fee or a greater percentage of the cost for insured dental care if the plan were to

cover more services? (Yes or No response).

We also collected data on the sponsor's military rank and family size (the number of dependent children under 21 years of age).

We present results for the overall sample and stratified by sponsor's rank, family size, enrollment status, and level of dependent dental care at current assignment. Due to non-response, sample size may vary.

Results

Table 1 shows enrollment in the Active Duty Dependents Dental Insurance Plan by selected demographics. Overall, about one-third of the spouses in our sample stayed enrolled in the ADDDIP. Although there is little variation by rank of sponsor or family size, pronounced differences in enrollment exist across levels of space available, military dental care. While nearly 60% of spouses at Army installations with low levels of space available care stayed in the dental insurance plan, only 10-20% of spouses with access to average to high levels of space available care did so.

Overall, about two-thirds of our sample feel the dependent dental plan is inadequate for their families' dental treatment needs. This attitude varies little across rank of sponsor, but shows considerable variation across other demographics. As family size increases and access to space available, military dental care improves, perceptions of the plan's adequacy drops. Enrollees (69.4%) and spouses willing to pay for an expanded plan (42.7%) are more likely to perceive the ADDDIP as adequate than non-enrollees

(19.4%) or spouses unwilling to pay for extra benefits (27.8%).

Whether the ADDDIP is perceived as a gain in military benefits varies across all demographic variables (Table 3). Officer spouses are more likely to view the dental insurance plan as a gain than enlisted spouses. Inverse relationships exist between perceived gain and family size and between perceived gain and level of space available dental care. Once again, enrollees and spouses willing to pay more for expanded coverage have more positive views of the ADDDIP than non-enrollees or spouses unwilling to pay more for dental insurance.

Table 4 shows that among enrollees, the leading reasons for staying in the ADDDIP include long queues (43.5%) and limited services (26.8%) for dependents at military dental clinics. Few spouses prefer civilian dentists (5.3%) or claim civilian dentists are more convenient (5.4%).

Among non-enrollees (Table 5), the leading reasons for quitting the ADDDIP include the plan's limited scope of coverage (31.0%) and a preference for care in military dental clinics (24.9%). Relatively few claim access to space available, dependent dental care is easy (10.4%). Few spouses fault premium costs (3.1%) or co-payment levels (5.5%) or think dental care off post is too expensive even with insurance (10.8%).

Overall, half of the spouses in our sample say they are willing to pay more for a better dental insurance plan (Table 6). Officer spouses are more willing than spouses with sponsors of other ranks. Willingness to pay for expanded benefits is invariant

across family size, however it varies substantially across levels of space available care and across enrollment status.

Discussion and Conclusions

The data in this study come from a convenience sample of spouses seeking care in military dental clinics. Our sample includes ADDDIP enrollees because enrollees may seek care for services not covered by the ADDDIP in military dental clinics. The lower overall ADDDIP enrollment seen in our sample (32.4%) versus actual enrollment (48%) suggests that our sample is not representative of Army spouses in general. Nonetheless, we believe our findings reflect the views of an important subset of spouses - spouses who seek care in military dental clinics. Ultimately, in order to expand enrollment, the ADDDIP must draw routine users of space available dental care away from military clinics. The core of an effective strategy to accomplish this must be based on understanding how and why routine users of space available care (like those in this sample) reacted to the plan.

A major finding from this study is the strong influence access to space available dental care has on enrollment choice and attitudes toward the ADDDIP. This intuitively makes sense. At installations with high access to space available, military dental care, Army families have little incentive to join the plan. Military families must pay to use the ADDDIP, whereas they do not pay for space available care in military dental clinics. Moreover, the plan covers few dental services. If the insurance plan was

expanded to cover more services than those routinely provided to dependents in military dental clinics, we predict the plan would attract high enrollments at all installations. We make this prediction because queues and limited range of services for dependents are the most common reasons spouses give for joining the ADDDIP. These conditions exist even at posts providing high levels of space available care.

Enrollment status and willingness to pay for expanded benefits demonstrate strong associations with attitudes toward the ADDDIP. Non-enrollees and spouses unwilling to pay for improved insurance tend to hold more negative views about the ADDDIP. Thus, in order to convert non-enrollees to enrollees, we must address their negative perceptions about the adequacy of the ADDDIP and whether it is a gain in benefits. We believe these negative perceptions could best be countered by an insurance plan covering more services than those routinely available to dependents in military dental clinics. Indeed, our results show that insufficient scope of coverage is the chief reason for non-enrollment in the Active Duty Dependents Dental Insurance Plan. Furthermore, a majority of our sample express a willingness to pay for expanded insurance benefits. That so few spouses fault the premium or co-payment of the ADDDIP suggests there is flexibility to raise either or both, in order to expand benefits and attract more Army families into the plan. To a Congress reluctant to fund wider benefits for military families, raising the premium or the co-payment offers a way to expand the Active Duty Dependents Dental Insurance Plan without

increasing government outlays for the program. In conclusion, our findings lead us to recommend a significant expansion of the benefits package of the Active Duty Dependents Dental Insurance Plan. If the expanded insurance plan covers more services than those routinely available to dependents in military dental clinics, Army families would have a strong incentive to enroll. We further recommend that marketing of an expanded plan emphasize range of coverage, consistent access to dental care regardless of assignment location, and quick access to quality care.

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Table 1
Enrollment in the ADDDIP By Family
Selected Demographics

	n	Percent Enrolled
<u>Sponsor's Rank</u>		
Enlisted	2685	32.4%
Warrant Officer	153	37.2%
Commissioned Officer	716	31.6%
<u>Family Size</u>		
No Children	795	32.2%
1 Child	880	35.0%
2 or more children	1878	31.2%
<u>Level of Space A Care</u>		
Below HSC Average	1418	56.7%
At HSC Average	799	9.6%
Above HSC Average	1339	20.3%
Total	3556	32.4%

Table 2
**Adequacy of ADDDIP In Meeting
Dental Needs by Selected Demographics**

	n	Percent Adequate
<u>Sponsor's Rank</u>		
Enlisted	2682	36.2%
Warrant Officer	153	35.3%
Commissioned Officer	715	33.3%
<u>Family Size</u>		
No Children	794	43.2%
1 Child	880	39.9%
2 or more children	1875	30.3%
<u>Level of Space A Care</u>		
Below HSC Average	1419	45.0%
At HSC Average	797	31.1%
Above HSC Average	1336	28.4%
<u>Enrollment Status</u>		
Enrolled	1150	69.4%
Not Enrolled	2397	19.4%
<u>Willingness to Pay More</u>		
Yes	1723	42.7%
No	1668	27.8%
Total	3552	35.6%

Table 3

ADDDIP: Gain or Loss of Military Benefits by Selected Demographics

	n	Percent Gain
<u>Sponsor's Rank</u>		
Enlisted	2680	36.6%
Warrant Officer	150	41.3%
Commissioned Officer	711	39.7%
<u>Family Size</u>		
No Children	792	41.8%
1 Child	875	39.7%
2 or more children	1873	34.5%
<u>Level of Space A Care</u>		
Below HSC Average	1415	52.2%
At HSC Average	794	30.4%
Above HSC Average	1334	25.9%
<u>Enrollment Status</u>		
Enrolled	1146	71.6%
Not Enrolled	2392	21.1%
<u>Willingness to Pay More</u>		
Yes	1719	50.3%
No	1664	23.7%
Total	3543	37.4%

Table 4
Most Important Reason for Staying in ADDDIP
(n= 1124)

	Percent of Enrollees
Long Queues at Military Dental Clinics	43.5%
Limited Services Provided at Military Dental Clinics	26.8%
Preference for Civilian Dentists	5.3%
Civilian Dentists More Convenient	5.4%
Other	19.0%

Table 5
Most Important Reason for Quitting the ADDDIP
(n= 2393)

Percent of Disenrollees	
Premium too Costly	3.1%
Co-Payment too Costly	5.5%
Preference for Military Clinics	24.9%
Military Care is Easy to Get	10.4%
Scope of Insurance Coverage is Inadequate	31.0%
Overseas Move Soon	5.3%
Off Post Dentistry too Expensive Even with ADDDIP	10.8%
Filing Insurance Claims is Trouble	0.9%
Other	8.0%

Table 6

Willingness to Pay for Expanded ADDDIP
Benefits by Selected Demographics

	n	Percent Yes
<u>Sponsor's Rank</u>		
Enlisted	2560	48.9%
Warrant Officer	144	52.8%
Commissioned Officer	690	57.7%
<u>Level of Space A Care</u>		
Below HSC Average	1347	64.3%
At HSC Average	770	44.3%
Above HSC Average	1279	40.7%
<u>Enrollment Status</u>		
Enrolled	1112	72.8%
Not Enrolled	2281	40.2%
Total	3396	50.9%

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**Reaction of Army Families with Grade School Children
to the Active Duty Dependents Dental Insurance Plan**

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Abstract

In March-May 1988, we collected data on enrollment of 1,445 Army families with grade school children in the Active Duty Dependents Dental Insurance Plan at two Army posts. We also surveyed their reactions to the plan. Results show although nearly two-thirds of families enrolled in the plan consider it a loss of benefits and coverage inadequate. Queues and limited services at military clinics are primary reasons for joining; poor coverage of the dental insurance plan is the main reason for not. A majority of families are willing to pay more for expanded coverage.

Introduction

Two years after its initiation, the Active Duty Dependents Dental Insurance Plan (ADDDIP) experienced a sizeable decline in enrollment. From its peak of 667,085 in July 1987, total nationwide enrollment in the dental plan fell to 630,262 by June 1989 (1,2). The House Armed Services Committee expressed its concern by ordering the Secretary of Defense to determine whether "this problem is a result of inadequate marketing or if situations exist that would actually discourage enrollment" (3). In considering probable explanations, the committee overlooked the possibility of faults in the plan itself.

In this study, we present findings from a survey of Army families that queried their reaction to the ADDDIP. Our data were collected shortly after the plan was activated and, to our knowledge, represent the first report of how Army families reacted to the ADDDIP. We believe our results provide valuable insights into the issue of declining enrollment.

Methods

This study collected data on enrollment of Army families in the Active Duty Dependents Dental Insurance Plan (ADDDIP) and their attitudes toward the plan in March-May, 1988. Following a brief description of the plan, parents of grade school children, ages 5-13, at on post schools at Ft. Lewis, Washington and Ft. Sam Houston, Texas were asked the following six questions (on self-administered questionnaires):

- 1) Do you think this plan is a gain or loss of benefits for military family members? (Gain or Loss response).
- 2) Will this insurance plan meet the dental treatment needs of your family? (Yes or No response).
- 3) Do you plan to stay in the Active Duty Dependents Dental Insurance Plan? (Yes or No response).
- 4) Please give the most important reason why you quit the Active Duty Dependents Dental Insurance Plan,
 - a) The monthly membership fee costs too much.
 - b) My having to pay 20% of the costs for fillings is too much,
 - c) I prefer to get care at a military dental clinic,
 - d) Family member care is easy to get on this post,
 - e) The plan does not cover enough services,
 - f) My family is moving overseas soon,
 - g) The cost of dental care off post is too high even with insurance,
 - h) Filing insurance claims is too much trouble,
 - i) Other (please specify).
- 5) Please give the most important reason why you stayed in the Active Duty Dependents Dental Insurance Plan,
 - a) Too long a wait for care at military dental clinics,
 - b) I prefer to be treated by civilian rather than military dentists,
 - c) Military dental clinics give only a few services to dependents,

- d) My family lives so far from post that it would be easier to go to a civilian dentist,
 - e) Other (please specify).
- 6) Would you be willing to pay a higher monthly fee or a greater percentage of the cost for insured dental care if the plan were to cover more services (Yes or No response).

This survey was completed as part of a study of the oral health of Army dependents. We received completed questionnaires from parents of 828 children at Ft. Sam Houston (96% of eligibles) and 1235 children at Ft. Lewis (57% of eligibles). We identified children from the same family to prevent families with multiple children from having greater influence on the results than families with only one child. With the family as the unit of analysis, our sample consisted of 545 families at Ft. Sam Houston and 900 families at Ft. Lewis. For each question, sample size may vary due to non-response.

Results

Figure 1 shows enrollment in the ADDDIP by rank group at each study site. Overall, 60% or better of the families in our sample enrolled in the dependent dental plan. The plan has its highest enrollment in families with commissioned officer sponsors (65.5-73.4%) and its lowest enrollment in families with warrant officer sponsors (37.5-47.1%).

Despite high enrollment, most families feel the plan is inadequate in meeting their dental treatment needs (Figure 2).

While enrollees are more likely to view the plan as adequate than non-enrollees (Figure 3), a majority of non-enrollees believe the ADDDIP is inadequate.

Overall, only 40-43% of families think the ADDDIP is a gain in military benefits. Figures 3 and 4 show considerable variation in attitude on this issue by rank and enrollment status. Families with commissioned officer sponsors (54-59%) are the only rank group where a majority view the ADDDIP as a gain in benefits. Enrollees are four times more likely to consider the dental insurance plan a gain in benefits (56.1-62.7%) than non-enrollees (12.2-13.8%).

Table 1 shows what enrollees claim is their most important reason for staying in the ADDDIP. The three leading reasons include long queues for dependent care in military dental clinics (42.6%-48.9%), limited services available to dependents in military dental clinics (24.3%-35.7%), and other (16.4-16.6%). Many respondents who selected other commented that they "felt they had no choice". Few Army families indicated a preference for civilian dentists or felt that civilian dentists are more convenient.

Table 2 shows reasons for disenrollment. (Army families were automatically enrolled in the plan and had to disenroll if they chose not to participate). The leading reason for disenrollment is that the plan does not cover enough services (46.6-50.3%). This is followed by a preference for care in military dental clinics (17.1-18.7%). Few disenrollees think the co-payment (3.9-4.3%) or the monthly enrollment fee (2.5-3.2%) is too high.

The willingness of Army families to pay more for an expanded insurance plan is shown in Figures 5 and 6. Across all ranks and enrollment status, a majority of families in this sample is willing to pay more for a plan with expanded benefits. Enrollees (74%) and families with officer spouses (75%) are most willing to do this.

Discussion and Conclusions

The data for this study come from families with grade school children attending schools on post at two Army installations. Excluded are families without elementary age children and all Army families who live off post. The results are, at best, representative of a subset of all Army families. However, this is an important subset. Families with young children generally have a keen interest in health benefits and for a dependent dental insurance plan to succeed, it must appeal to this constituency.

While results from this study show that a majority of our sample stayed enrolled in the Active Duty Dependents Dental Insurance Plan, they did not do so with enthusiasm. The most common reasons for enrolling are negative features of care in overcrowded military dental clinics rather than positive features of civilian dental care. Overwhelming majorities feel the ADDDIP is inadequate for their families' dental treatment needs. Limited coverage is the most common reason families quit the plan. Most families consider the ADDDIP a loss in military benefits.

These findings coupled with the fact that nearly two thirds or more of our sample is willing to pay for expanded coverage suggests

to us that the chief failure of the ADDDIP is not marketing but content.

During the time this paper was under review, premiums for the ADDDIP went up from \$3.85 to \$4.57 a month for one dependent and from \$7.86 to \$9.42 a month for two or more dependents. Accompanying this premium increase was a modest expansion of benefits for children--sealants, space maintainers, and prefabricated resin crowns for primary front teeth (4).

Enrollment in the ADDDIP has improved since its ebb in 1989. According to Delta Dental Plan of California, which administers the plan, the downward trend in enrollment has reversed. Some of this is attributed to better command emphasis of the plan within the military. However, some of it is owed to another trend rather than an inherent attractiveness of the ADDDIP. Since military manpower staffing models no longer allow stateside dependent dental care to count for staffing purposes, access to space available dependent dental care has been shrinking.

We have no more recent measure of perceptions toward the plan than those we report. It is possible that over time as military families have used the benefit, they have gained more favorable attitudes toward the ADDDIP. However, we are more inclined to believe that discontentment with the insurance plan remains high because there has been no substantive expansion of benefits and because the alternative, space available dependent dental care, is rapidly disappearing.

Six months ago, the Department of Defense personnel chief suggested that the \$10 per month cap on paycheck deductions for the ADDDIP be lifted to keep the plans benefits from eroding with inflation and to allow coverage for a wider range of dental services (5). Bills allowing the program to expand are under consideration in both houses of Congress. The House bill seeks to add benefits to the basic plan that would apply to all enrollees, while the Senate bill proposes supplemental plans for specific types of dental services.

We endorse these moves because they recognize that limited dependent dental benefits, whether under the insurance plan or in military dental clinics, are the cornerstone of service members discontent with the status quo. Expansion of benefits in the ADDDIP should enhance enrollment and satisfaction among Army families. We recommend that expansion of the plan should be preceeded by a careful analysis of what benefits dependents want and how much extra they are willing to pay for them.

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Enrollment Status By Site And Rank Group

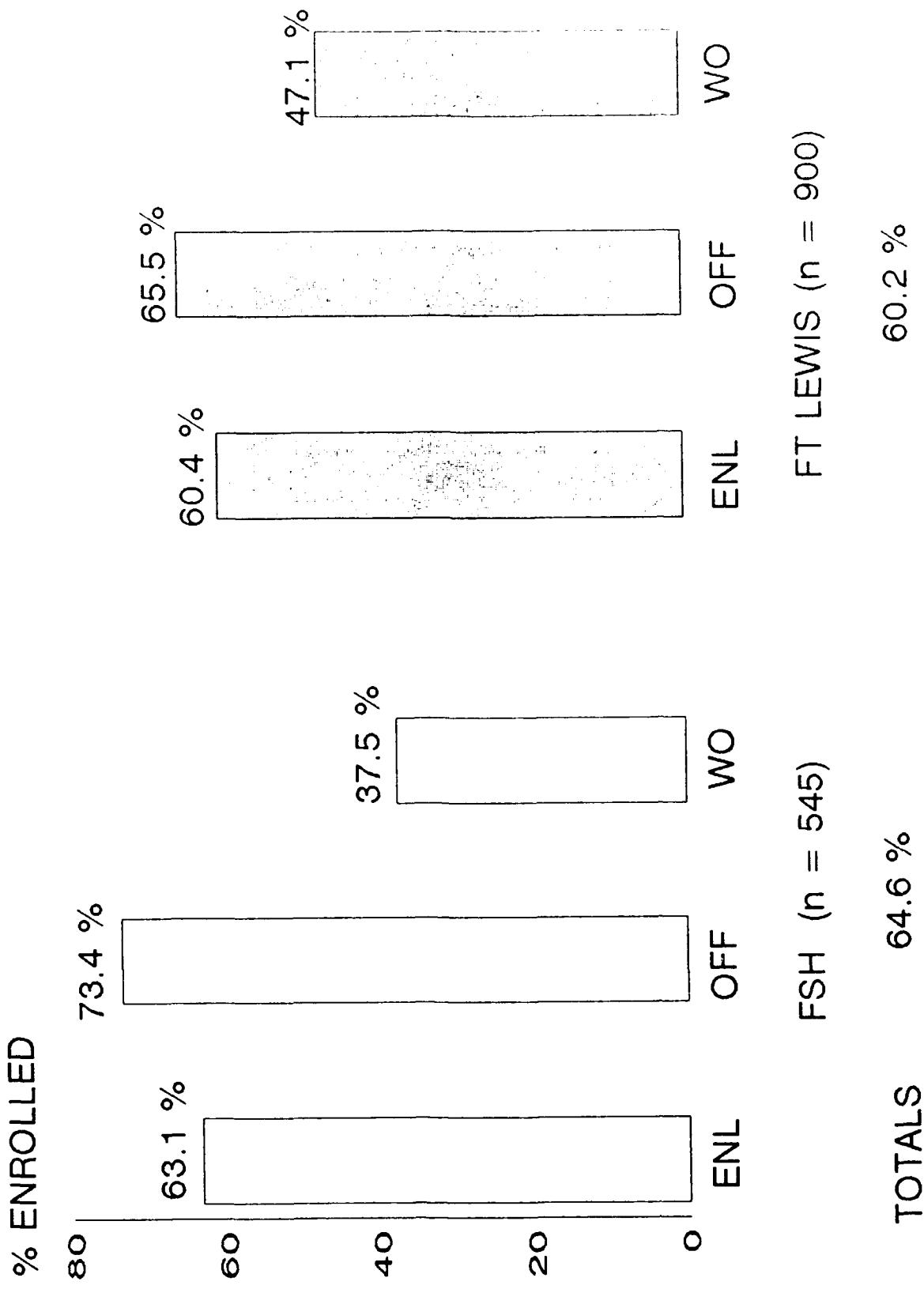
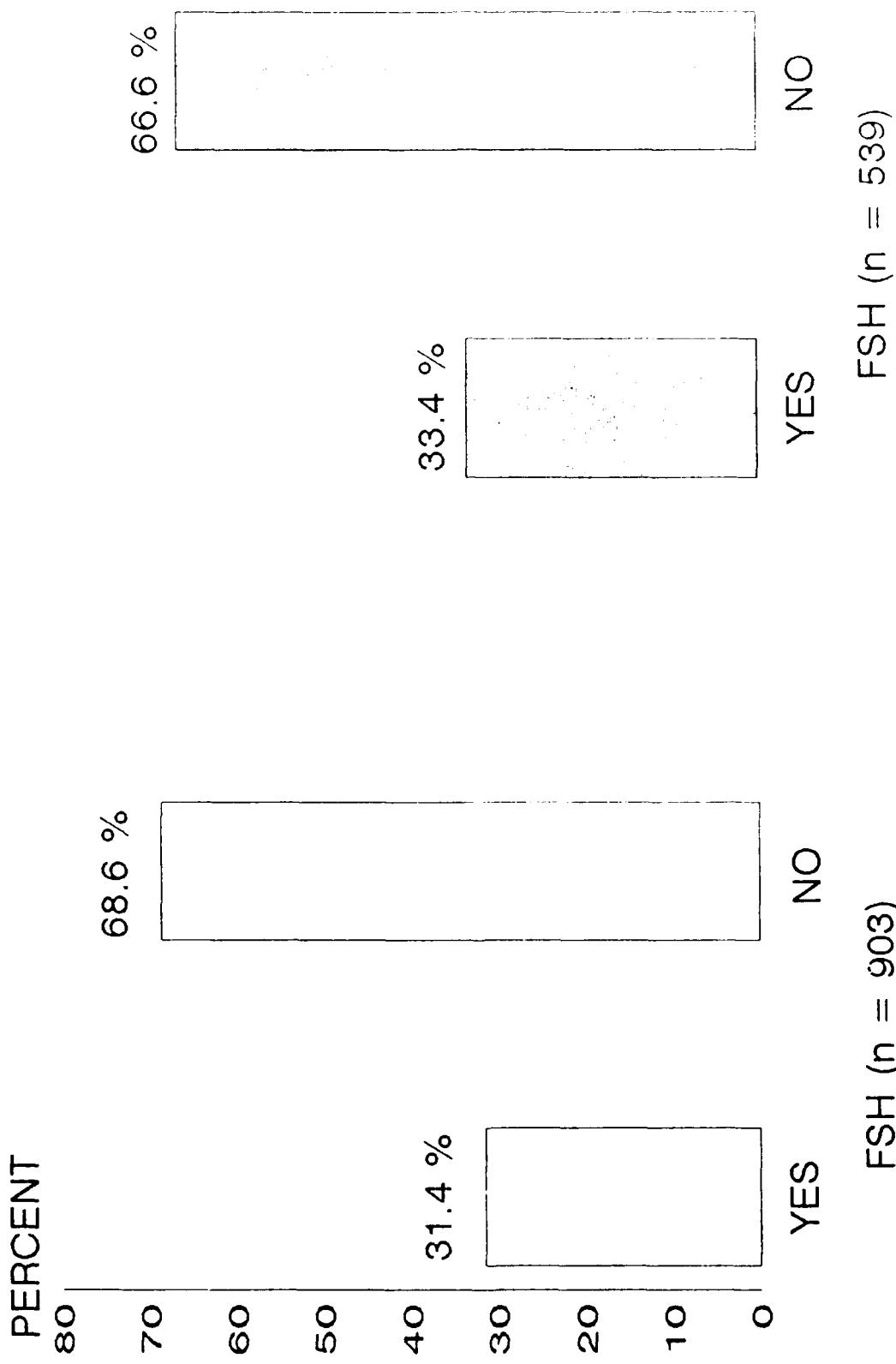


Figure 1

Will This Plan Meet The Dental Treatment
Needs Of Your Family? By Site



Note: Response invariant by enrollment/officer rank group

Figure 2

Will This Plan Meet The Dental Treatment Needs Of Your Family? By Site/Enrollment

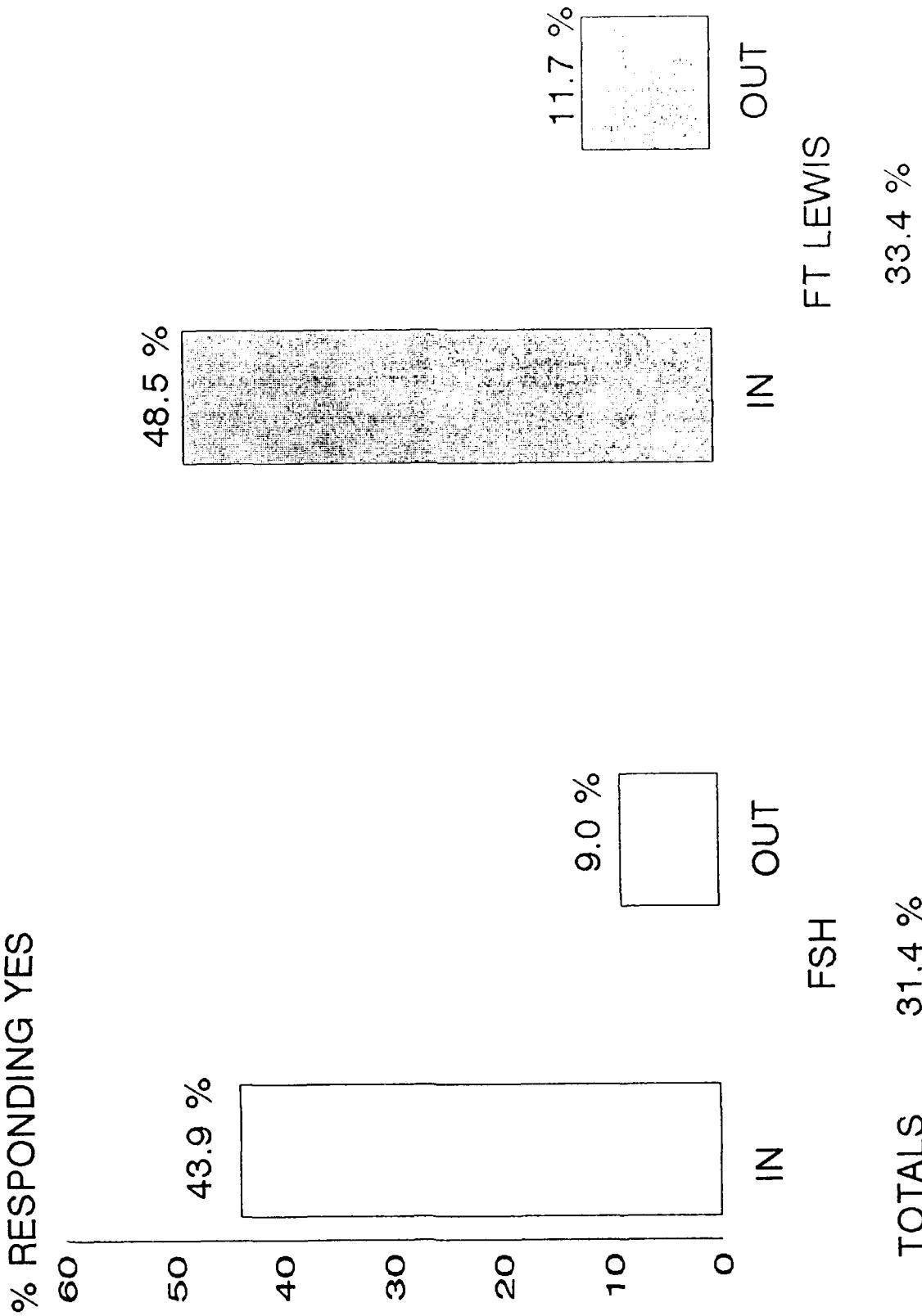
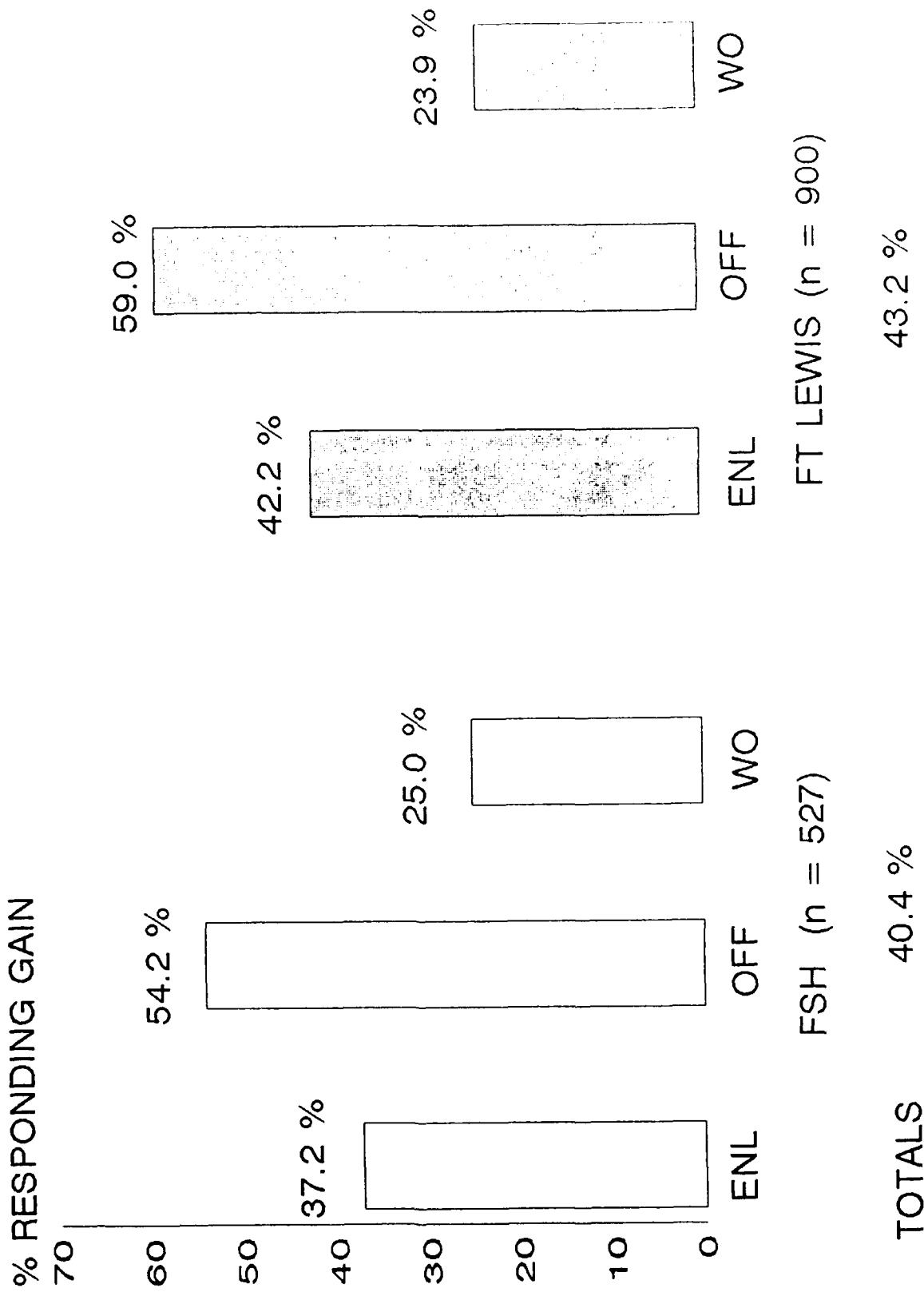


Figure 3

Do You Think This Plan Is A Gain Or Loss Of Benefits? By Site/Rank



Do You Think This Plan Is A Gain Or Loss Of Benefits? By Site/Enrollment

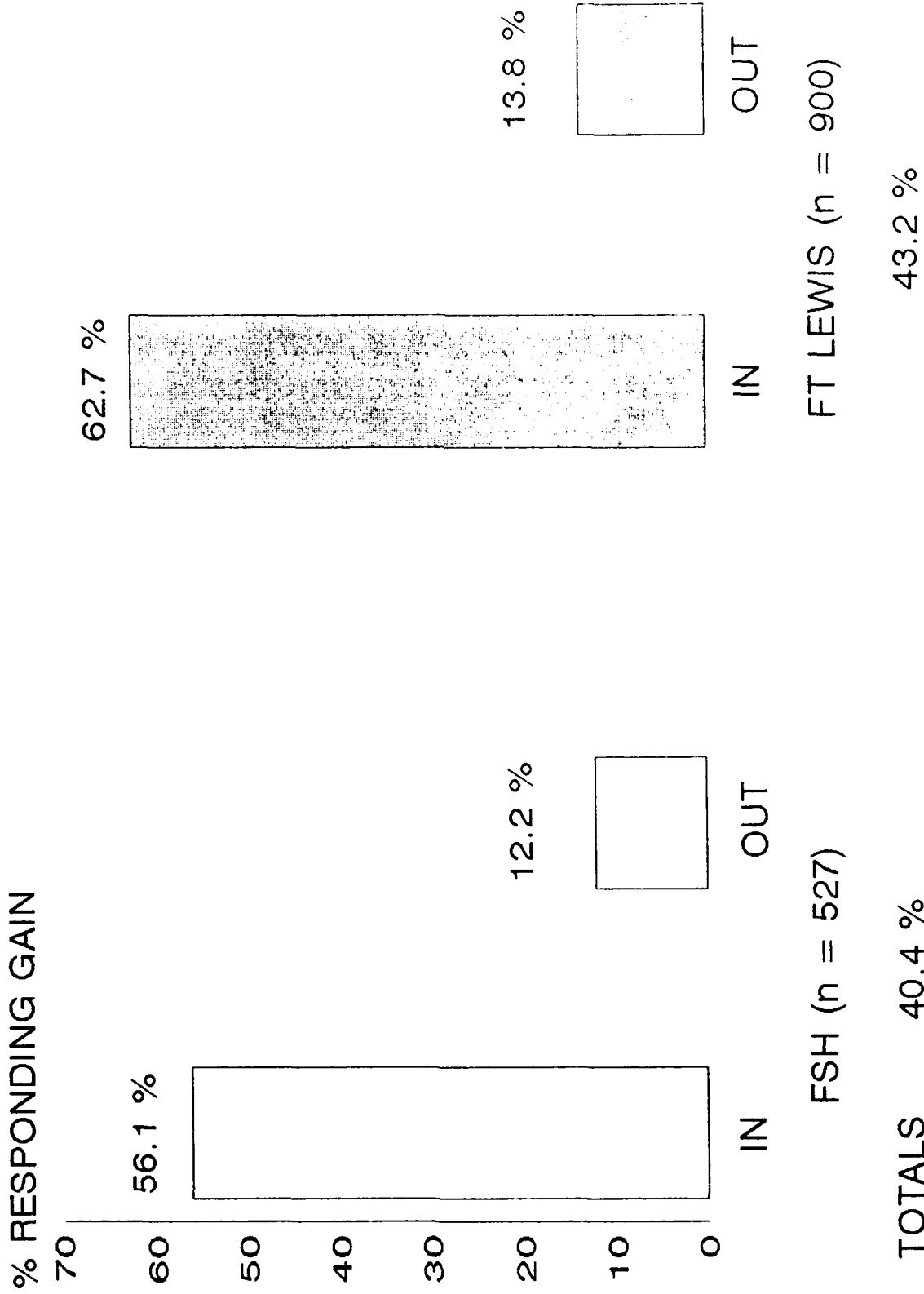


Figure 5

TABLE 1

MOST IMPORTANT ENROLLED IN ADDDIP SITE

	% of Sample
	Ft. Sam Houston Ft. Lewis (N = 319) (N = 523)
Queues	42.6
Limited services	35.7
Other	16.6
Prefer civilian DDS	4.1
Civilian convenient	0.9
	48.9
	24.3
	16.4
	10.3
	0.0

TABLE II

MOST IMPORTANT REASON FOR DISENROLLING FROM
THE ADDDIP BY SITE

Reason	Ft. Sam Houston (N = 187)	Ft. Lewis (N = 358)
Poor Coverage	50.3 %	46.6 %
Prefer military clinic	17.1 %	18.7 %
Other	10.7 %	5.6 %
Civilian too expensive	9.1 %	14.8 %
Co-payment too high	4.3 %	3.9 %
Going OCONUS	3.2 %	4.7 %
Fee too high	3.2 %	2.5 %
Military care easy	2.1 %	2.8 %
Paperwork	0 %	0.3 %

Would You Pay More For An Expanded Plan? By Site/Rank

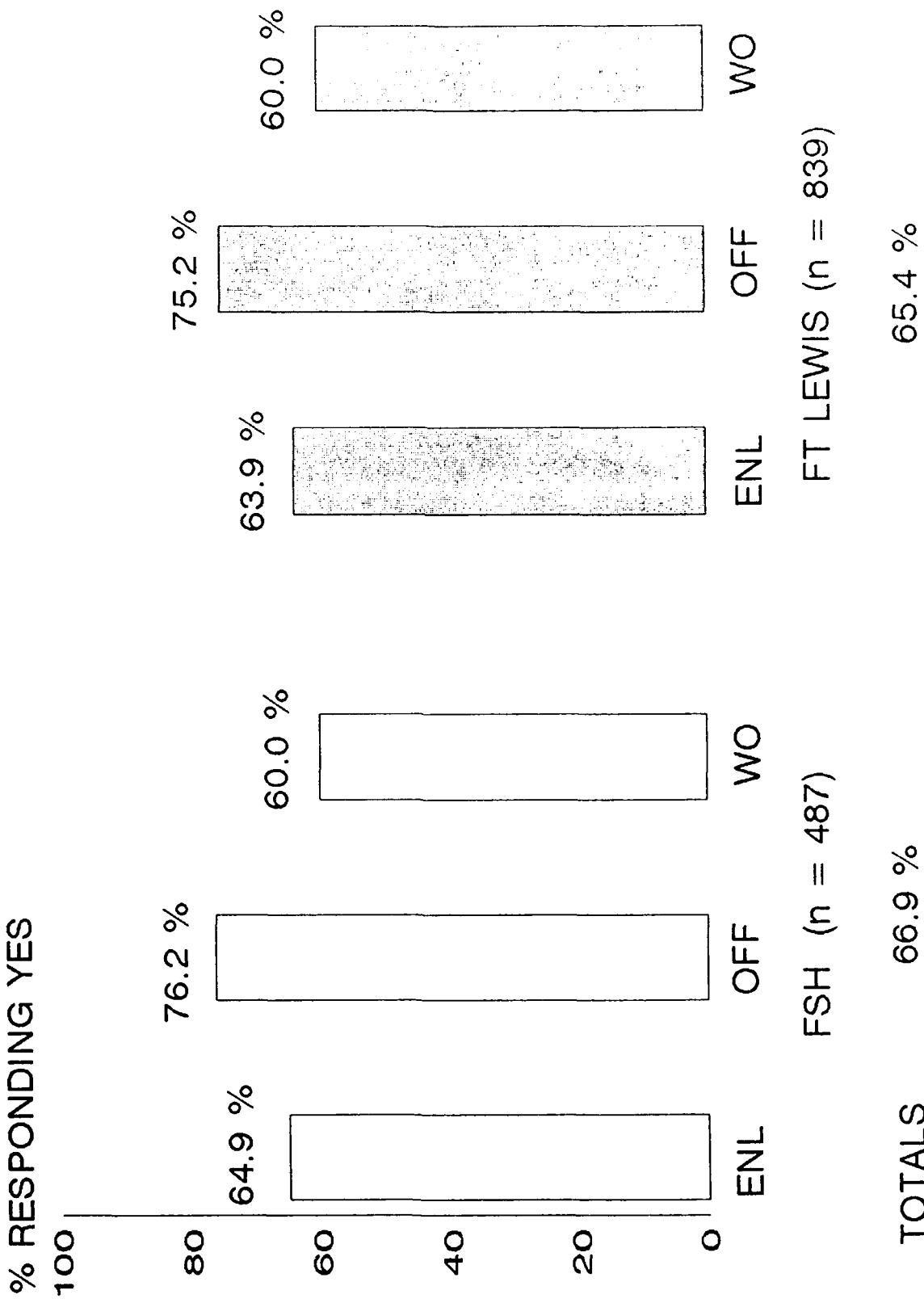


Figure 6

Would You Pay More For An Expanded Plan? By Site/Enrollment Status

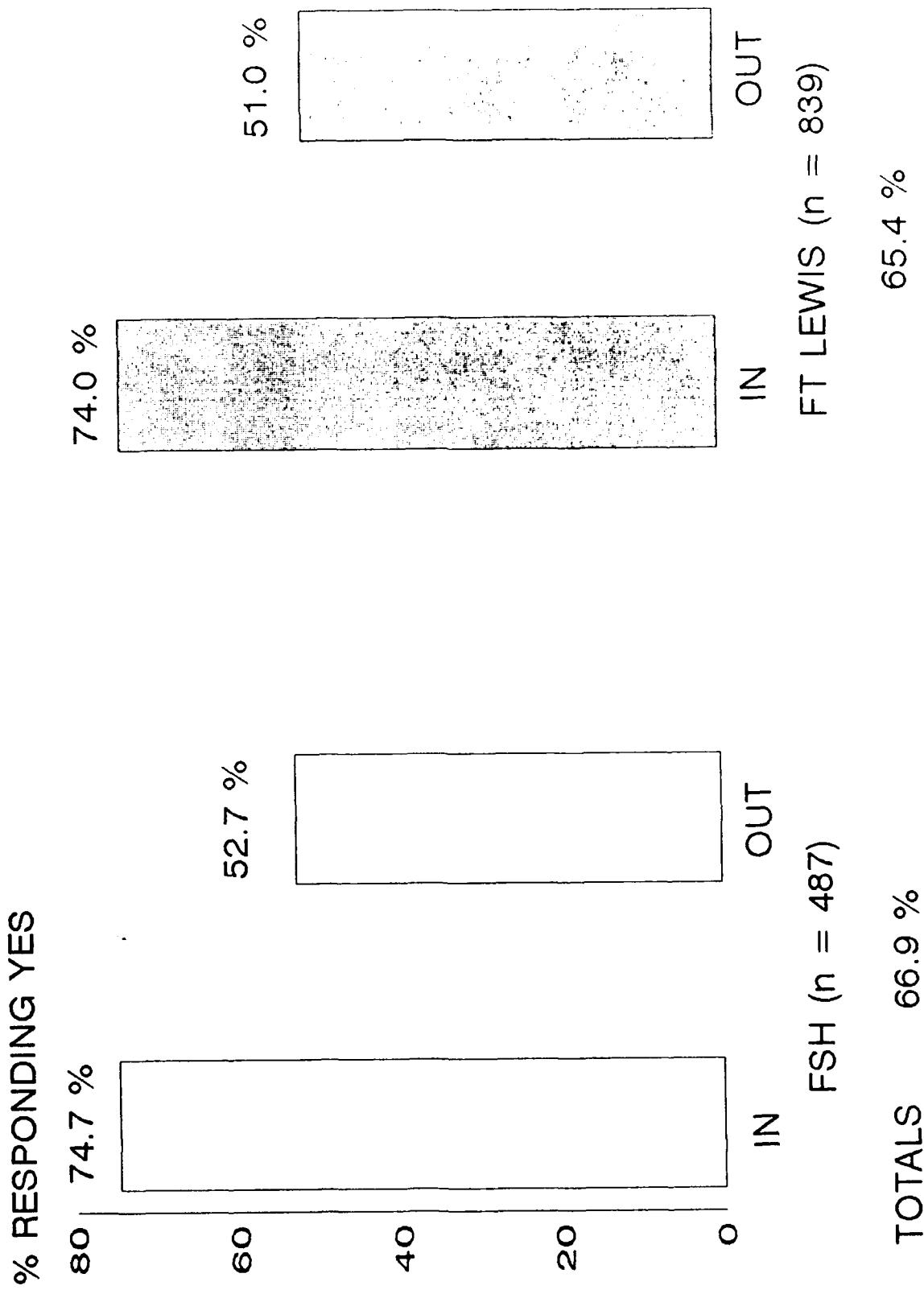


Figure 7

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Dental Utilization by School Age

Dependents of Active Duty Soldiers

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Previous Presentation: Data was presented in a poster session at the general session of the International Association for Dental Research, Cincinnati, Ohio, March 7-11, 1990.

Abstract

This study assesses dental utilization by school age dependents (ages 5-17) of active duty soldiers. Data were collected in March-May 1988 from 2,140 self-administered, parental questionnaires at two Army posts. Results show dental utilization by soldiers' children equals or exceeds national norms. Dental utilization by dependent minority children exceeds national norms by as much as 24%. The percentage of soldiers' children who have never seen a dentist is half that of their national cohorts. These results may be due to income differences or to soldiers' children having access to space available, military, dental care or dental insurance.

Introduction

To our knowledge, the utilization of dental services by military dependents has never been investigated. Yet this is an important measure to monitor as a quality of life indicator for military families. It also is a useful monitor to determine whether the Active Duty Dependents Dental Insurance Plan is widening access to dental care for military families.

In this paper, we assess the dental utilization of grade school children (ages 5-17) of active duty soldiers at two Army installations. The data are compared between these two posts and to national norms.

Methods

The data for this report come from a twelve site study of the dental health of Army family members which was completed by the Dental Studies Division, U.S. Army Health Care Studies and Clinical Investigation Activity (HCSCIA). This study assessed dental treatment needs, oral health status, dental utilization, perceived need for dental care, enrollment in the Active Duty Dependents Dental Insurance Plan (ADDDIP), and attitudes toward the ADDDIP.

We selected two study sites for children, Ft. Sam Houston, Texas and Ft. Lewis, Washington. Ft. Sam Houston was selected because it has both a grade school and a high school on post. Only four Army posts in the continental United States have high schools. We did not select Ft. Campbell or Ft. Knox, Kentucky because we had used these sites in the pilot study (1) for this full-scale

project. Nor did we select Ft. Meade, Maryland because it has a mixed military and civilian enrollment. This would have made sampling difficult.

Because Ft. Sam Houston is predominantly an Army Medical Department Post, it has a higher representation of families of upper socioeconomic status (high income, high education, and high health awareness) than many other Army posts. To control for the bias this might introduce, we collected data on children at Ft. Lewis, Washington. Ft. Lewis is predominantly a combat arms post with six grade schools.

Data on dental utilization by children was collected on self-administered parental questionnaires. A total of 1,119 questionnaires were returned by parents of 5-11 year olds at Ft. Lewis (54% of eligibles) and 728 questionnaires at Ft. Sam Houston (98% of eligibles). The better response rate at Ft. Sam Houston is due to aggressive follow-up of nonrespondents. Time and travel budget constraints did not permit a follow-up at Ft. Lewis. For 12-17 year olds, 293 parents returned survey questionnaires (57% of eligibles). Data was collected between March and May 1988.

Demographic data (age, sex, and race) was collected by the dental officer who examined and charted each child's oral health status and dental treatment needs. One dental officer examined all of the children. Regarding dental utilization by their children, we asked parents two questions: how long it had been since their child last saw a military dentist, and how long it had been since their child last saw a civilian dentist. Using the shorter of the

two intervals, we derived the time since the child last saw any dentist. Responses were categorized into four intervals - never, within a year, one to two years, and three or more years. We did this to make our data comparable to a national study of the same age cohort (2).

Results

Tables 1 and 2 compare to national norms the interval since last dental visit for the total sample and for the sample stratified by sex and by age for 5-11 year olds at Ft. Sam Houston and at Ft. Lewis, respectively. Similarly, Table 3 compares dental utilization of 12-17 year old dependents to their national cohorts. Results show that at Ft. Sam Houston, annual dental utilization by the total sample and by all subgroups for both grade school children and teen-agers exceeds national norms. At Ft. Lewis, annual dental utilization equals national norms with two notable exceptions. Annual dental utilization by Black and Hispanic dependent 5-11 year olds exceeds national norms by 7% and 10%, respectively. At Ft. Sam Houston, annual dental utilization by 5-11 year olds in both of these ethnic groups exceeds national norms by 15%. Among minority dependent teen-agers, annual dental utilization exceeds national norms by 22-24%.

At both study sites males and females have similar annual rates of dental utilization, and in general, whites are more likely to have seen a dentist within the past year than other ethnic groups. However, the gap in the utilization rates between white

and nonwhites is narrower in the military samples than in the national one. Annual dental utilization by white and Hispanic dependent teen-agers is equivalent.

The proportion of children who have never seen a dentist is markedly lower among Army dependents than in the national sample. At both study sites whites (with the exception of teen-agers) are less likely to have never seen a dentist than other ethnic groups. Again, the gap in nonuser rates between whites and nonwhites is narrower in the military samples than in the national sample.

Enrollment level in the ADDDIP differs between the two posts by only 4%. We found no difference in annual utilization rates between enrollees and non-enrollees in the Active Duty Dependents Dental Insurance Plan at either site.

Discussion and Conclusions

Annual dental utilization by school age dependent children of active duty soldiers is high and compares favorably with national norms. Nearly three-quarters or better of 5-11 year old and four-fifths of 12-17 year old dependents in this study have seen a dentist within the past year. The impressive gains in dental utilization by nonwhites suggests that the military offers these groups a way to enhance their quality of life. Owing to small sample size, the dental utilization rate of Hispanic teen-agers must be viewed with caution.

We attribute the higher utilization generally seen in the military samples over the national sample to income or benefit

differences between the two groups. All military households have at least one employed parent. This may not be so in the national sample. Moreover, unlike the national sample, soldiers' children have access to space available military dental care or to dental insurance.

Our finding of no difference in dental utilization between enrollees and non-enrollees in the ADDDIP suggests that the dependent dental insurance plan has not widened access for Army children to dental care. We caution, however, that this study was done less than a year after the program was started and at only two Army posts. The ADDDIP may have a greater influence on utilization by spouses than by children or on both groups at other Army posts.

The slightly higher utilization and slightly lower nonuser rates seen at Ft. Sam Houston as compared to Ft. Lewis may be due to a higher proportion of families of upper socioeconomic status at Ft. Sam Houston or may be due to differences in access to space available military dental care. According to 1986 data from Health Service Command, nearly twice as much of the total dental services delivered went to dependents at Ft. Sam Houston (32.3%) compared to Ft. Lewis (17.4%). Because of the impact that space available dental care may have on dental utilization, we must be careful in applying the results of this study to Army families in general.

Our results lead us to conclude that soldiers are generally taking advantage of the dental health benefits that the military offers their children. We recommend that utilization of dental services by Army dependents be surveyed periodically to follow

long-term trends, especially to determine whether dependent dental insurance is improving access to dental care for military families.

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Table 1

Comparison of Interval Since Last Dental Visit and Demographic Characteristics of 5-11 year olds at Ft. Sam Houston to the 1986 National Survey +

Interval Since Last Dental Visit	Sex					
	Total		Males		Females	
	FSH	NCHS n=728	FSH	NCHS n=342	FSH	NCHS n=386
1 year	78.0%	71.8%	79.2%	70.5%	77.0%	73.1%
2 years	11.4%	8.1%	10.8%	8.5%	11.9%	7.7%
3 + years	5.1%	8.5%	5.3%	8.8%	4.9%	8.3%
never	5.5%	11.6%	4.7%	12.2%	6.2%	10.9%
Race						
Interval Since Last Dental Visit	White		Black		Hispanic	
	FSH	NCHS n=	FSH	NCHS n=	FSH	NCHS n=
	387	18,862	189	3520	137	2504
1 year	81.9%	74.4%	74.1%	58.7%	73.7%	58.9%
2 years	9.6%	7.6%	12.7%	10.6%	13.1%	7.1%
3 + years	4.6%	7.7%	5.8%	13.4%	5.1%	13.3%
never	3.9%	10.3%	7.4%	17.3%	8.1%	20.7%

+ National Center for Health Care Statistics

Table 2

Comparison of Interval Since Last Dental Visit and Demographic Characteristics of 5-11 year olds at Ft. Lewis to the 1986 National Health Survey +

Interval Since Last Dental Visit	Sex							
	Total		Males		Females			
	Lewis	NCHS	Lewis	NCHS	Lewis	NCHS		
1 year	72.5%	71.8%	72.0%	70.5%	73.0%	73.1%		
2 years	12.2%	8.1%	12.5%	8.5%	12.0%	7.7%		
3 + years	7.1%	8.5%	5.9%	8.8%	8.2%	8.3%		
never	8.1%	11.6%	9.6%	12.2%	6.8%	10.9%		
Race								
Interval Since Last Dental Visit	White		Black		Hispanic		Other	
	Lewis	NCHS	Lewis	NCHS	Lewis	NCHS	Lewis	NCHS
	n=	n=	n=	n=	n=	n=	n=	n=
1 year	74.8%	74.4%	65.8%	58.7%	69.0%	58.9%	75.4%	73.3%
2 years	11.7%	7.6%	16.3%	10.6%	12.6%	7.1%	8.0%	8.3%
3 + years	7.1%	7.7%	7.9%	13.4%	4.6%	13.3%	7.3%	7.9%
never	6.4%	10.3%	10.0%	17.3%	13.8%	20.7%	9.3%	10.5%

+ National Center for Health Care Statistics

Table 3

Comparison of Interval Since Last Dental Visit and Demographics
 Characteristics of 12-17 year olds at Ft. Sam Houston to the 1986
 National Health Survey +

Sex

Interval since Last Dental Visit	Total		Males		Females	
	FSH n=	NCHS n=	FSH n=	NCHS n=	FSH n=	NCHS n=
293	21,089		144	10,677	149	10,412
1 year	82.6%	71.1%	81.9%	69.3%	83.2%	73.1%
2 years	12.6%	8.9%	14.6%	9.3%	10.8%	8.5%
3 + years	3.1%	16.5%	2.1%	17.8%	4.0%	15.1%
never	1.7%	3.5%	1.4%	3.6%	2.0%	3.3%

Race

Interval Since Last Dental Visit	White		Black		Hispanic	
	FSH n=	NCHS n=	FSH n=	NCHS n=	FSH n=	NCHS n=
195	17,199		62	3242	30	1978
1 year	83.6%	74.1%	77.4%	55.6%	83.3%	59.2%
2 years	10.8%	8.4%	17.8%	11.4%	16.7%	9.2 %
3 + years	4.1%	14.8%	1.6%	25.9%	0%	22.7%
never	1.5%	2.7%	3.2%	7.1%	0%	8.9%

+ National Center for Health Statistics

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Dental Treatment Needs of Spouses of Active
Duty Army Soldiers

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Key Words:
dependent spouses,
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periodontal needs

Disclaimer: The opinions or assertions contained herein are the private ones of the authors and are not to be construed as official or as reflecting the views of the U.S. Army or the Department of Defense.

Previous Presentation: Data were presented in a poster session at the annual meeting of the American Public Health Association in Chicago, Illinois, October 22-26, 1989.

ABSTRACT

From August 1987 to March 1988, we charted the dental treatment needs (restorative, periodontal, and orthodontic) of 3,562 spouses at 10 Army installations. X-rays were not used. Results show one-fifth of spouses have no treatment needs. Among spouses requiring restorative care, 53.2% have only 1-3 teeth in need of care. The most commonly needed restorative procedures include one surface restorations (28.1%), removable replacements (22%), crown and bridge (15.2%), and extractions (13.3%). Periodontal scaling is required by 23.6% of spouses; 7.9% need periodontal surgery. One-fifth have severe or handicapping malocclusions. Dental treatment needs of Army spouses are complex and costly.

Introduction

When the Active Duty Dependents Dental Insurance Plan (ADDDIP) was designed, makers of military health policy had little knowledge of the dental treatment needs of dependents. At that time, the most current study on this topic had been completed in 1977 (1). Since then, studies in the civilian population have documented a substantial decline in dental caries in the United States (2-5). There have also been major shifts in the demographic composition of the Army since 1977. Demographics have an impact on oral health status and dental treatment needs (6,7).

To design a suitable dental insurance plan, policy makers should know the dental treatment needs of the target population. With this objective in mind, the Dental Studies Division, U.S. Army Health Care Studies and Clinical Investigation Activity designed a study to assess the dental treatment needs of dependents of active duty Army personnel. The purpose of this paper is to describe the dental treatment needs of Army spouses in aggregate. We discuss how the ADDDIP relates to fulfilling those needs.

Methods

We selected 10 sites to collect data on 3,562 spouses. Sites included Ft. Richardson, Alaska; Hawaii; Ft. Ord, California; Ft. Lewis, Washington; Ft. Benning, Georgia; Ft. Hood, Texas; Ft. Bliss, Texas; Ft. Belvoir, Virginia; Ft. Gordon, Georgia; and Ft. Campbell, Kentucky. We selected sites reflecting different costs of living and levels of space available dependent dental care

because these factors might have an impact on the treatment needs of spouses.

We used two sampling strategies. Initially, we selected a random sample of spouses at each study site using the terminal digit in their military sponsor's social security number with the assistance of the Standard Installation and Division Personnel and Eligibility Reporting System (SIDPERS). Because the response rate to this strategy was so low (8-20%), we switched to clinic-based, convenience sampling. That is, we asked spouses reporting to military dental clinics to participate in the study. Distinction between spouses seeking routine and emergency care was made. Consequently, we identified three types of patients in the study: 1) random (n=1561), 2) routine (n=1556), and 3) sick call (emergency n=445). We collected data on spouses from August 1987 to March 1988.

One dental officer per site charted needs for restorative care (1-5 surface amalgams, composites, fixed and removable replacements, extractions), periodontal scaling and surgery, and orthodontic treatment. No x-rays were used.

For determining all except orthodontic needs, examiners were instructed to use their clinical judgment. They also used their clinical judgment to assign each tooth a treatment class (routine or emergency) based on the tooth's potential to cause a dental emergency within twelve months. We calibrated examiners in use of the Treatment Priority Index (TPI) (8) to assess orthodontic needs. We excluded the edentulous and individuals who were missing teeth

used in the index. Thus, for this measure our sample drops to 3,464. Instead of reporting TPI scores, we present the interpretation of those scores. That is, we present the proportion of the sample having normal occlusions or minor malocclusions, elective orthodontic needs, severe malocclusions, and handicapping malocclusions.

Finally, examiners assigned each subject a dental fitness classification based on all treatment needs. Class 1 means the subject needs no dental treatment except possibly an oral prophylaxis. Class 2 means the subject needs routine dental care. Class 3 means the subject has a dental condition capable of developing into a dental emergency within twelve months if left untreated.

Results

Table 1 shows the percent of our sample who have restorative or periodontal treatment needs. Nearly three-quarters of dependent spouses need some type of restorative care. Periodontal care is required by far fewer spouses with needs for periodontal scaling (23.6%) exceeding needs for periodontal surgery (7.9%). Treatment needs for all these procedures are markedly greater for sick call patients than for others.

The intensity of restorative treatment needs is given in Table 2. Among spouses with restorative needs, just over half of random/routine patients need only one to three teeth treated. Over three-quarters of this group require treatment of six or fewer

teeth. Sick call patients show a greater intensity of restorative treatment needs. Over 60% have four or more teeth requiring restorative care.

A total of 12,395 teeth in our sample were identified as needing restorative care. We show the mix of restorative treatment needs in Table 3. The most common treatment need is one surface restorations (28.1%). Removable replacements are next (22%), followed by crown and bridge (15.2%). Removable partial dentures account for nearly all removable prosthetic needs (Table 4).

Table 5 displays the intensity and mix of treatment requirements for spouses with periodontal needs. Overall, about half of spouses who need periodontal scaling require treatment in only one to two sextants of their mouths. Full mouth scaling (5-6 sextants) is required by less than a third. Sick call patients have strikingly greater need for full mouth scaling than random/routine patients. Periodontal surgery needs show less variation across type of patient. Overall, two-thirds of spouses in need of periodontal surgery require only one to two sextants treated.

Most spouses (49.1%) require no orthodontic treatment (Table 6). However, 21.8% have severe or handicapping malocclusions.

When all restorative, periodontal, and orthodontic treatment needs are taken into consideration, only one-fifth of all spouses have no dental treatment needs, except possibly an oral prophylaxis (Table 7). Approximately one-fourth of all spouses harbor a potential dental emergency (dental fitness class 3). Only 5% of

sick call patients are in dental fitness class 1. While most random/routine patients (55.1% to 58.6%) need only routine dental care (dental fitness class 2), nearly two-thirds of sick call patients have a dental condition with the potential to cause a dental emergency within 12 months if left untreated (dental fitness class 3).

Discussion

The data in this study come mostly from a convenience sample of spouses using military dental clinics. Thus our findings may not be representative of Army spouses in general. However, our sample probably is representative of spouses who seek care in military dental clinics.

Our results show that most dependent spouses (79.7%) need some type of dental care other than an oral prophylaxis. A remarkably high proportion of spouses (26%) have a potential dental emergency. Clearly the dental treatment needs of Army dependents are largely unmet.

Army spouses have a complex and costly mix of dental treatment needs. The most common need is for restorative care. Nearly three-quarters of spouses require amalgams, composites, crowns, bridges, partial or full dentures, or extractions. While the intensity of these required services is low to moderate (most spouses having one to six teeth involved), the restorative mix is expensive. Among teeth in need of restorative care, 37.2% require costly prosthetic treatment. Twenty percent or more of spouses

require costly orthodontic or periodontal care.

Although the Active Duty Dependents Dental Insurance Plan (ADDDIP) was intended to contribute to improving the oral health of military dependents, results from this study suggest that the ADDDIP, in its present form, will have limited impact. The current plan provides no coverage for orthodontic or periodontal treatment and covers only limited restorative procedures. Notably absent is coverage for extractions, complete or partial dentures, crowns, and bridges. Half of the restorative mix identified in our sample is not covered.

We conclude that the status quo (the ADDDIP plus limited space available military dental care) is not adequately meeting the dental treatment needs of Army spouses. We recommend that military health policy makers address this shortcoming by significantly increasing levels of space available military dental care or by significantly expanding the benefits package of the Active Duty Dependents Dental Insurance Plan.

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Table 1

PERCENT OF SPOUSES WITH RESTORATIVE OR PERIODONTAL
TREATMENT NEEDS BY TYPE OF PATIENT

TREATMENT NEED	n =	TYPE OF PATIENT			TOTAL
		RANDOM	ROUTINE	SICK CALL	
RESTORATIVE NEEDS		1,561	1,556	445	3,562
PERIODONTAL SCALING		71.8 %	67.9 %	91.9 %	72.6 %
PERIODONTAL SURGERY		23.8 %	21.7 %	29.4 %	23.6 %
		8.5 %	5.9 %	12.8 %	7.9 %

Restorative needs include 1-5 surface amalgams or composites, fixed or removable replacement teeth, and extractions

Table 2
NUMBER OF TEETH NEEDING CARE IN SPOUSES WITH
RESTORATIVE NEEDS BY TYPE OF PATIENT

# of TEETH NEEDING CARE	n =	TYPE OF PATIENT			
		RANDOM	ROUTINE	SICK CALL	TOTAL
1 - 3		55.3 %	57.3 %	36.4 %	53.0 %
4 - 6		23.6 %	21.7 %	26.4 %	23.3 %
7 +		21.1 %	21.0 %	37.2 %	23.7 %

Table 3

DISTRIBUTION OF PROCEDURES FOR TEETH NEEDING
RESTORATIVE CARE (n = 12,395 TEETH)

PROCEDURE	PERCENT
1 SURFACE RESTORATION	28.1 %
2 SURFACE RESTORATION	13.2 %
3-5 SURFACE RESTORATION	8.2 %
CROWN & BRIDGE (FIXED REPLACEMENT)	15.2 %
EXTRACTION	13.3 %
REMOVABLE REPLACEMENT	22.0 %

Table 4

REMOVABLE PROSTHETIC REQUIREMENTS OF SPOUSES
(n = 3,562)

TYPE OF PROSTHETIC	PERCENT
COMPLETE DENTURES	0.5 %
MAXILLARY DENTURE ONLY	0.7 %
MANDIBULAR DENTURE ONLY	-----
REMOVABLE PARTIAL DENTURES	9.2 %

Table 5

NUMBER OF SEXTANTS NEEDING TREATMENT IN SPOUSES
WITH PERIODONTAL NEEDS BY TYPE OF PATIENT

# of SEXTANTS	n =	TYPE OF PATIENT			TOTAL
		RANDOM	ROUTINE	SICK CALL	
SCALING		372	338	131	841
	1 - 2	50.0 %	48.9 %	39.7 %	47.9 %
	3 - 4	19.9 %	24.3 %	14.5 %	20.7 %
	5 - 6	30.1 %	26.8 %	45.8 %	31.4 %
SURGERY		133	92	57	282
	1 - 2	70.8 %	70.1 %	76.5 %	67.0 %
	3 - 4	20.4 %	14.1 %	5.8 %	16.5 %
	5 - 6	8.8 %	15.8 %	17.7 %	16.5 %

Table 6
PERCENT OF SPOUSES NEEDING ORTHODONTIC TREATMENT
(n = 3,464)

ORTHODONTIC TREATMENT NEED	PERCENT
NORMAL or MINOR	49.1 %
ELECTIVE	29.1 %
SEVERE	12.3 %
HANDICAPPING	9.5 %

Table 7
DENTAL FITNESS CLASS OF SPONSES BY TYPE OF PATIENT

DENTAL FITNESS CLASS	n =	TYPE OF PATIENT			TOTAL
		RANDOM 1,561	ROUTINE 1,556	SICK CALL 445	
CLASS 1		20.4 %	24.7 %	4.9 %	20.3 %
CLASS 2		55.1 %	58.6 %	31.9 %	53.7 %
CLASS 3		24.5 %	16.7 %	63.2 %	26.0 %

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**Dental Treatment Needs of School Age
Children of Active Duty Soldiers**

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sealant needs

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ABSTRACT

This study describes the dental treatment needs of 2,063 grade school and 299 teen-age dependents at two Army posts. Needs for sealants, restorative care, and orthodontic care were charted without X-rays by one dentist in March - May 1988. Results show restorative treatment requirements of dependent children are low in intensity and simple in mix. Many may be preventable by the timely application of sealants. Sealants are the leading treatment need. Malocclusion prevalence is comparable to national norms.

Introduction

Within the past two decades, national studies have documented a dramatic decline in dental caries in children in the United States (1-3). According to data from the most recent national survey on children, the prevalence of dental caries declined 36% in 5-17 year olds between 1979 and 1986 (3).

The last study of the dental treatment needs of children of active duty soldiers was completed in 1977 (4). The purpose of this paper is to describe their current needs and to determine how well the Active Duty Dependents Dental Insurance Plan (ADDDIP) meets those needs.

Methods

We collected data on dental treatment needs of 2,362 children, ages 5-19, at two study sites, Ft. Lewis, Washington and Ft. Sam Houston, Texas. We chose Ft. Sam Houston because it has both a grade school and high school on post. Ft. Lewis was selected because it has six grade schools. Cooperation of school officials, contrasting socioeconomic status at the two posts, and differing levels of space available dependent dental care also influenced our choice. Ft. Sam Houston is predominantly an Army Medical Department post, with a greater proportion of families of high income, high education, and high health awareness than many other Army posts. In contrast, Ft. Lewis is predominantly a combat arms post. Past studies have shown that socioeconomic status may influence oral health status (5,6). According to 1986 data from

Health Services Command, the amount of space available dental care at Ft. Sam Houston (32.3%) was nearly double that of Ft. Lewis (17.4%).

One dental officer charted the entire sample from March - May 1988. Requirements for restorative care, sealants, and orthodontic care were noted. Restorative needs included one to five surface restorations, stainless steel crowns, extractions, and fixed (crowns and bridges) or removable (full or partial dentures) prosthetics. The examiner determined sealant needs by applying the following criterion: if a dental explorer would catch in a non-decayed occlusal, facial, or lingual surface on a molar or premolar, a sealant was needed. For children under the age of 12, we evaluated the need for space maintenance using a computer algorithm to compare missing teeth noted on examination with an age and sex adjusted tooth eruption chart (7). We assessed orthodontic treatment needs using the Treatment Priority Index (TPI) (8). Because the TPI requires the presence of certain permanent teeth, five year olds were excluded from assessment as were older children who were missing key teeth used in the index. To make our results comparable to national studies (9,10), we restricted our grade school sample to ages 6-11 and our high school sample to ages 12-17.

Based on all assessed treatment needs, the examiner assigned each patient a dental fitness classification. Class 1 means the child needs no dental treatment except possibly an oral prophylaxis. Class 2 means the child needs routine dental care.

Class 3 means the child has a dental condition that may develop into an emergency if left untreated for twelve months.

Finally, using assessed treatment needs, we determined the proportion of our sample that would qualify for non-maintenance care under the Active Duty Dependents Dental Insurance Plan. Non-maintenance care refers to procedures other than examinations and oral prophylaxes.

A total of 828 grade school children at Ft. Sam Houston (98% of eligibles) and 1,235 at Ft. Lewis (54% of eligibles) were examined. At the Ft. Sam Houston high school we examined 299 students (57% of eligibles). Examinations were done with parental consent.

Results

Table 1 shows the proportion of our sample by study site who need restorative care or sealants. Only 17-28% of school age children require restorative treatment while 34-40% require sealants. There is little difference between the two grade school samples. Teen-agers are less likely to have restorative needs but more likely to have sealant needs than grade school children.

Among children with restorative needs, most (83-91%) have only one to three teeth involved (Table 2). Grade schoolers at Ft. Sam Houston have fewer teeth with restorative needs than grade schoolers at Ft. Lewis or teen-agers.

In Table 3, we present the distribution of procedures for teeth needing restorative treatment. The leading procedure

required by all groups (39-58%) is one surface restorations. Seventy percent or more of the teeth in each sub-sample require one or two surface restorations. We found no cases where space maintainers were required. Grade school children at both study sites have similar distributions of restorative needs.

The number of tooth surfaces that need to be sealed in children requiring this type of care is given in Table 4. Most require only one or two tooth surfaces sealed. Teen-agers tend to have greater sealant needs than grade school children.

Orthodontic treatment needs include references to two national studies for 6-11 (9) and 12-17 (10) year olds. The distribution of grade schoolers at both study sites closely resembles data from national studies (Table 5). Most (62-65%) of grade schoolers have normal occlusions or just minor misalignments of teeth. However, 13-15% have severe or handicapping malocclusions. The pattern of orthodontic treatment needs for teen-agers deviates from national norms somewhat. Dependent teen-agers are more likely to have normal occlusions or just minor misalignments of teeth.

When all treatment needs are considered, two-fifths of grade schoolers and nearly one-half of teen-agers have no dental treatment needs (dental fitness class one), except possibly an oral prophylaxis (Table 6). The majority of the remainder need routine dental care (dental fitness class 2). Few have dental emergencies. The distribution of dental fitness class is similar across study sites.

Based on all assessed treatment requirements, about a quarter of all grade schoolers and only 12.4% of teen-agers would qualify for non-maintenance services covered by the Active Duty Dependents Dental Insurance Plan (ADDDIP). If benefit coverage of the ADDDIP was expanded to cover all dental treatments, over half of our sample would qualify (Table 7).

Discussion

Because our data for grade school children comes from only two military posts and our data on teen-agers from just one, our results may not be representative of dependent school age children at large. However, the consistency in findings between the two grade school samples suggests the high school sample may not be atypical. Moreover, the similarity in treatment needs between two posts with widely different levels of space available dental care suggests that dental care is rationed fairly evenly over time. In other words because military families move frequently, no one group of children is exposed consistently to low access to space available dental care. Alternatively, the similar treatment need profiles of the two grade school samples may reflect the fact that children at these two sites are receiving an equal proportion of dental services (while spouses may not be). The Active Duty Dependents Dental Insurance Plan (ADDDIP) should help alleviate such imbalances if they exist.

Overall, the dental treatment needs of this sample are remarkably low. Better than 70% of dependent grade school children

and teen-agers have no restorative treatment needs. The intensity of restorative treatment needs is low. Eighty percent or more of school children with restorative needs have only one to three teeth involved. Their restorative mix is simple. Seventy percent or more of the teeth needing restorative work require one or two surface restorations. Such low restorative requirements explain why so few school children in this sample qualified for non-maintenance care under the original ADDDIP.

The greatest treatment need in this sample is sealants. The original ADDDIP did not cover this procedure. Now it does (11). This feature should help strengthen the preventive aspects of the ADDDIP and may help contribute to lowering caries prevalence in dependent children. The most common restorative treatment need in our sample is one surface restorations. Many of these could have been prevented by the timely application of sealants.

A significant number of children in our sample have severe or handicapping malocclusions (13-23%) and would benefit greatly from orthodontic care. Unfortunately, the ADDDIP does not cover this treatment need.

We conclude that the dental treatment needs of dependent school-age children are low and have the prospect of getting lower since application of sealants is now covered by dependent dental insurance. However, sealants will have no impact on the prevalence of malocclusion. We recommend the makers of military health policy explore the option of incorporating orthodontic care into the ADDDIP benefits package.

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Table 1

PERCENT OF SCHOOL AGE CHILDREN WITH RESTORATIVE*
OR SEALANT TREATMENT NEEDS BY STUDY SITE

DENTAL TREATMENT NEED	n =	FHS Elementary 828	SITE	
			Ft. Lewis Elem. 1,235	FSH High School 299
RESTORATIVE		25.5 %	28.1 %	17.1 %
SEALANT		33.8 %	35.6 %	39.5 %

* Restorative needs include 1-5 surface amalgams or composites, space maintainers, stainless steel crowns, extractions, crowns and bridges

Table 2

NUMBER OF TEETH NEEDING CARE IN SCHOOL CHILDREN
WITH RESTORATIVE NEEDS BY STUDY SITE

# TEETH NEEDING CARE	n =	SITE		
		FHS Elementary 211	Ft. Lewis Elem. 347	FSH High School 51
1 - 3 TEETH		90.5 %	82.7 %	84.3 %
4 - 6 TEETH		7.1 %	14.1 %	11.8 %
7 + TEETH		2.4 %	3.2 %	4.0 %

Table 3

DISTRIBUTION OF PROCEDURES FOR TEETH NEEDING
RESTORATIVE CARE BY STUDY SITE

PROCEDURE	n (teeth) =	SITE		
		FSH Elementary 401	Ft. Lewis Elem. 713	FSH High School 90
1 SURFACE RESTORATION		40.1 %	39.0 %	57.8 %
2 SURFACE RESTORATION		34.7 %	38.3 %	12.2 %
3-5 SURFACE REST.		6.0 %	4.5 %	2.2 %
STAINLESS STEEL CROWN		11.5 %	9.7 %	---
EXTRACTIONS		7.7 %	8.5 %	17.8 %
CROWN & BRIDGE		---	---	10.0 %

Table 4

NUMBER OF TOOTH SURFACES NEEDING SEALANTS IN
CHILDREN WITH SEALANT NEEDS BY STUDY SITE

# SURFACES NEEDING SEALANTS	n =	SITE		
		FHS Elementary 280	Ft. Lewis Elem. 440	FSH High School 118
1		48.9 %	48.6 %	31.4 %
2		29.3 %	29.8 %	20.3 %
3		13.9 %	12.7 %	19.5 %
4 OR MORE		7.9 %	8.9 %	28.8 %

Table 5

PERCENT OF SCHOOL CHILDREN NEEDING
ORTHODONTIC TREATMENT BY STUDY SITE

ORTHODONTIC TREATMENT NEEDS	n =	SITE				
		FHS*	Ft. Lewis*	FSH	NCHS*	NCHS+
		Elem.	Elem.	HS+		
NORMAL OR MINOR		65.0 %	61.5 %	58.7 %	63.4 %	45.8 %
ELECTIVE		21.6 %	24.0 %	18.1 %	22.4 %	25.2 %
SEVERE		7.9 %	9.6 %	13.4 %	8.7 %	13.0 %
HANDICAPPING		5.5 %	4.9 %	9.8 %	5.5 %	16.0 %

* Ages 6-11

+ Ages 12-17

Table 6

DENTAL FITNESS CLASS OF SCHOOL CHILDREN BY STUDY SITE

DENTAL FITNESS CLASS	FHS Elementary n = 828	SITE	
		Ft. Lewis Elem. 1,235	FSH High School 298
1	44.6 %	43.2 %	47.7 %
2	50.4 %	50.9 %	51.0 %
3	5.0 %	6.0 %	1.3 %

Table 7

PERCENT QUALIFYING FOR NON-MAINTENANCE CARE
BY TYPE OF PLAN

PATIENT GROUP	ORIGINAL ADDDIP	COMPREHENSIVE PLAN
FSH CHILD	22.0 %	50.7 %
FT LEWIS CHILD	25.5 %	54.7 %
FSH YOUTH	12.4 %	52.3 %

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**Prevalence of Caries Free Teeth and
Sealants in School Age Dependent Children**

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ABSTRACT

In this study, we compare the caries-free status of permanent teeth and prevalence of sealants in 2,063 5-12 year old and 254 13-17 year old dependents of active duty military personnel to their civilian cohorts. On both of these oral health status measures, military dependent children score better than their civilian cohorts. The better oral health status of military dependent children may be attributable to their access to cost-free, space available military dental care or access to civilian dental care through the Active Duty Dependents' Dental Insurance Plan.

Introduction

One measure of oral health status in children is the proportion of children whose permanent teeth are caries free. A 1986 national survey of 40,000 children, ages 5-17, by the National Institute of Dental Research (NIDR) has shown that the proportion of children caries free in their permanent teeth has risen 13% since 1980. Although the cause of this improvement is unknown, researchers speculate that it is due to a combination of fluoride and dental sealants (1).

The purpose of this paper is to compare school age children of active duty soldiers to their national cohorts with regard to the proportion whose permanent teeth are caries free. We also compare the proportion who have dental sealants.

Methods

The data for this report come from The Dental Health of Army Family Members, an oral health survey of Army dependents completed in 1986 by the Dental Studies Division, U.S. Army Health Care Studies and Clinical Investigation Activity. We collected data on children at two sites - Ft. Sam Houston, Texas and Ft. Lewis, Washington. We selected these sites because they have large schools on post, school administrators were cooperative and they represent extremes in two factors that might have an impact on oral health status. These factors are socioeconomic status and level of space available, dependent dental care.

Because Ft. Sam Houston is predominantly an Army Medical Department post, it has a higher proportion of families from upper socioeconomic status (high income, high education, and high health awareness) than many other Army posts. According to 1986 data from Health Services Command (HSC), 32.3% of the total dental services delivered at Ft. Sam Houston went to dependents. In contrast, Ft. Lewis is predominantly a combat arms post. In 1986 17.4% of total dental services delivered there went to dependents.

Data on the caries free status of permanent teeth and the presence of sealants were collected by a calibrated dentist. One dentist completed all examinations on children. A total of 828 children, ages 5-12, were examined at Ft. Sam Houston (98% of eligibles) and 1,235 at Ft. Lewis (59% of eligibles). An additional 254 students, ages 13-17, were examined at Ft. Sam Houston (50% of eligibles). Data were collected between March and May 1988.

Results

Table 1 shows the age distribution of the study sample. The distributions for the two grade school sites are very similar. Within the high school sample, all ages are nearly equally represented.

The percent of children who are caries free in their permanent teeth by age and study site for grade school children (ages 5-12) is presented in Table 2. Table 3 presents this data for high school students (ages 13-17). Included in each table, for reference, are results from the National Survey of Oral Health in

U.S. Schoolchildren: 1986-1987 which was completed by the National Institute of Dental Research (NIDR) (1).

For all ages, except 15 year olds, a larger proportion of dependent children are caries free in their permanent teeth. The gap between our sample and the national sample ranges from 1.4% (15 year olds at Ft. Sam Houston) to 18.3% (12 year olds at Ft. Sam Houston). The gap exceeds 5% in half of all age groups. In general, the proportion of dependent children caries free in their permanent teeth is greater at Ft. Sam Houston (FSH) than at Ft. Lewis. The gap between the FSH and the national sample tends to widen as age increases for 6 year olds (1.7%) to 12 year olds (18.3%). This trend does not hold for Ft. Lewis grade school children.

Table 4 compares the percent of children in our sample and in the NIDR sample who have dental sealants on at least one tooth surface. The NIDR figure refers to ages 5-17 (2) whereas we report the prevalence of sealants for 5-12 year olds (elem) and 13-17 year olds (h.s.) separately. The prevalence of sealants is clearly higher in the dependent than in the national sample. Grade school children at FSH are nearly twice as likely to have dental sealants than their counterparts at Ft. Lewis.

Discussion

The decline in dental caries noted in the most recent national survey of the oral health status of American children is mirrored in our sample of dependent children of active duty soldiers.

However, the decline is dramatically greater among dependent children at Ft. Sam Houston than at Ft. Lewis. This may be due to differences in socioeconomic status, higher access to space available dental care, the prevalence of dental sealants, or other factors.

The higher prevalence of dental sealants in dependent children than in the national sample suggests a greater awareness or acceptance of this preventive measure by military personnel than by civilians.

Expanded application of sealants to the teeth of dependent children may occur now that sealants are a covered benefit under the Active Duty Dependents Dental Insurance Plan (3). This may, in turn, lead to further declines in the caries prevalence in school age, dependent children.

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Table 1
AGE DISTRIBUTION OF STUDY SAMPLE

<u>AGE</u>	<u>GRADE SCHOOL</u>		<u>FT LEWIS</u>	
	<u>N</u>	<u>%</u>	<u>n</u>	<u>%</u>
5	77	9.2%	70	5.7%
6	129	15.6%	204	16.5%
7	145	17.5%	215	17.9%
8	116	14.0%	205	16.6%
9	116	14.0%	179	14.5%
10	101	12.2%	142	11.5%
11	101	12.2%	137	11.1%
12	43	5.3%	83	6.7%
TOTAL	828	100.0%	1235	100.0%
<u>HIGH SCHOOL</u>				
13	53	20.9%		
14	62	24.4%		
15	54	21.3%		
16	49	19.3%		
17	36	14.1%		
TOTAL	254	100.0%		

Table 2
**PERCENT OF CHILDREN CARIES FREE IN
 THEIR PERMANENT TEETH (AGE X SOURCE)**

AGE	SOURCE					
	FSH+	GAP WITH		GAP WITH		
		NIDR*	FT LEWIS	NIDR*	NIDR*	NIDR*
5	100	2.7	100	2.7	97.3	
6	96.1	1.7	94.6	0.2	94.4	
7	89.7	5.5	88.4	4.2	84.2	
8	84.5	9.5	77.6	2.6	75.0	
9	77.4	11.9	67.6	2.1	65.5	
10	72.3	16.6	72.5	16.8	55.7	
11	59.4	14.4	45.3	0.3	45.0	
12	60.0	18.3	53.8	12.1	41.7	

+ FSH = Ft. Sam Houston

* NIDR = National Survey of Oral Health in U.S. Schoolchildren:
 1986-87, National Institute of Dental Research

Table 3

PERCENT OF CHILDREN CARIES FREE IN
THEIR PERMANENT TEETH (AGE X SOURCE)

AGE	SOURCE		
	FSH+	NIDR*	NIDR*
13	47.2	13.2	34.0
14	38.7	11.0	27.7
15	20.4	-1.4	21.8
16	28.6	8.6	20.0
17	19.4	3.8	15.6

+ FSH = Ft. Sam Houston

* NIDR = National Survey of Oral Health in U.S. Schoolchildren:
1986-87, National Institute of Dental Research

Table 4

PERCENT OF CHILDREN
WITH SEALANTS

SURFACES SEALED	# OF			
	FSH ELEM+	FT LEWIS ELEM*	FSH H.S.**	NIDR ***
AT LEAST				
1 SURFACE	26.4%	14.0%	35.6%	7.6%

+ Fort Sam Houston 5-12 year olds

* Ft. Lewis 5-12 year olds

** Ft. Sam Houston 13-17 year olds

*** National Survey of Oral Health in U.S. Schoolchildren 1986-
87, National Institute for Dental Research, 5-17 year olds

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**Expanding Benefits Under the
Active Duty Dependents Dental Insurance Plan**

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**Key words: Active Duty Dependents Dental Insurance Plan, dental
insurance, benefits, coverage, dependents**

Disclaimer: The opinions or assertions contained herein are the private ones of the authors and are not to be construed as official or as reflecting the views of the U.S. Army or the Department of Defense.

Abstract

In fall 1988, we surveyed a national random sample of 2,110 officer and 4,114 enlisted Army families that were eligible to enroll in the Active Duty Dependents Dental Insurance Plan (ADDDIP). Results show limited satisfaction with the plan and an overwhelming willingness to pay \$5 or more per month extra for expanded benefit coverage. Services most desired to be added to the plan include orthodontics, prosthetics, endodontics, and oral surgery. We applaud Senate Armed Services Committee 's recent decision to expand the ADDDIP and recommend comprehensive coverage.

Introduction

In mid-July 1991, the Senate Armed Services Committee approved a measure to raise the maximum premium for the Active Duty Dependents Dental Insurance Plan (ADDDIP) from \$10 to \$20 per month. The measure authorizes the Department of Defense to determine what additional benefits to include in the ADDDIP subject to the limitation that military families not be asked to pay more than 50% of the cost of expensive dental services, such as crowns and bridges (1). Anticipating that expansion of ADDDIP benefits might be a concern for military health policy makers, the Dental Studies Division, U.S. Army Health Care Studies and Clinical Investigations Activity (HCSCIA), in conjunction with the U.S. Army Personnel Survey Division, Soldier Support Center (SSC) fielded a questionnaire that asked military families what extra benefits they would like to see in the ADDDIP and how much extra they would be willing to pay for them. We believe our findings will be of value to military health policy makers at this critical juncture in the development of the ADDDIP.

Methods

Biannually, the Army Personnel Survey Division, Soldier Support Center conducts a sample survey of military personnel. Samples are selected at random from the Standard Installation/Division Personnel System (SIDPERS) using the last two digits of the service member's social security number. Approximately 10% of officers and 5% of enlisted personnel are selected to participate

worldwide. For the fall 1988 SSC survey, 3,936 of the officers selected for the survey completed questionnaires giving a response rate of 60%. The response rate for the 11,288 enlisted personnel was similar (57%).

For the fall 1988 SSC survey, the Dental Studies Division of HCSCIA submitted nine questions related to the Active Duty Dependents Dental Insurance Plan. In this report we focus on five of those questions:

- 1) Are you currently enrolled in the Active Duty Dependents Dental Insurance Plan? (Yes or No response).

- 2) What is the most important reason you enrolled in the Active Duty Dependents Dental Insurance Plan (ADDDIP)?
 - a) Does not apply; I am not enrolled in the ADDDIP.
 - b) The wait for care at military dental clinics is too long.
 - c) I prefer treatment by civilian rather than military dentists.
 - d) Military dental clinics offer only limited family services.
 - e) Location of dentists is more convenient.
 - f) I felt I had no choice.
 - g) Other reason.

- 3) How satisfied are you with the quality of the ADDDIP services provided to your family?
 - a) Does not apply; my family has not participated in the ADDDIP.
 - b) Very satisfied.
 - c) Satisfied.

- d) Neither satisfied nor dissatisfied.
 - e) Dissatisfied.
 - f) Very dissatisfied.
- 4) What dental service, currently not covered under the ADDDIP, would you MOST like to have included in the plan? SELECT ONE ONLY.
- a) Root canals.
 - b) Braces.
 - c) Gum surgery.
 - d) Crowns (caps) and bridges.
 - e) Extractions (tooth removal).
 - f) Partial or full dentures.
 - g) Sealants.
 - h) Other.
 - i) I do not know.
- 5) How much extra in monthly membership fees would you be willing to pay if the ADDDIP covered the additional services you selected above?
- a) Does not apply; I do not participate in the ADDDIP and do not plan to participate.
 - b) No extra fees.
 - c) Less than \$5 a month.
 - d) \$5 to \$9.99 a month.
 - e) \$10 to \$14.99 a month.
 - f) \$15 to \$19.99 a month.

g) \$20 or more a month.

All administrative aspects of this survey, including pretesting of the survey questionnaire and screening and editing of completed questionnaires, were completed by the Soldier Support Center. SSC also completed a preliminary analysis of the data using the entire sample. However, HCSCIA reanalyzed the data limiting the sample to insurance eligibles. Insurance eligibles include soldiers stationed in the continental United States, Alaska, Hawaii, and Puerto Rico and who are: 1) married to nonactive duty spouses, 2) married to active duty spouses and have children less than 21 years old, or 3) single, divorced, filing for divorce, or widowed and have children less than 21 years old. We were able to define this subset of the entire sample because of the extensive demographic data SSC routinely collects on its surveys. For our analysis, we had 2,110 officer and 4,114 enlisted insurance eligibles.

Results

Figure 1 shows enrollment in the ADDDIP by rank group. The plan has higher enrollment among senior personnel and officers are more likely to enroll than enlisted personnel. The only rank group where a majority is enrolled in the plan is field grade officers.

Satisfaction with the ADDDIP is consistent across enlisted ranks, however dissatisfaction increases as one moves from junior to senior personnel (Figure 2). In contrast, among officers (Figure 3), satisfaction with the ADDDIP increases and dissatisfaction drops as one moves from junior to senior rank. In both enlisted and

officer groups, there is a considerable amount of ambivalence toward the ADDDIP. About one-quarter of both groups have neutral opinions about the dependent dental insurance plan.

Table 1 codes the responses presented in Figures 4 and 5, the most important reason for enrolling the ADDDIP. Although the rank order varies, the top three reasons for enrolling in the insurance plan are the same for officers and enlisted personnel--long waits for care at military dental clinics, limited family services at military dental clinics, and felt they had no choice. These three choices account for nearly 70% of responses among those who enrolled.

Figures 6 and 7 show that a majority of both officers and enlisted personnel are willing to pay \$5 or more a month for an expanded dental insurance plan. Officers are slightly more willing to do so than enlisted personnel.

With regard to additional services wanted, both groups overwhelmingly prefer orthodontic coverage. Other expensive dental procedures such as crowns, bridges, and root canals follow. Very few military families favor inclusion of dental sealants, gum surgery, or dentures.

Discussion and Conclusions

The data for this report come from a random sample of Army personnel throughout the United States and Puerto Rico. Because of the command emphasis placed on SSC surveys, they typically have good response rates and are representative of the Army at-large.

A major finding from this study is that satisfaction with the quality of the Active Duty Dependents Dental Insurance Plan shows neither a strong endorsement nor a strong condemnation. To us this suggests that more in-depth research is needed on this topic.

Quality of care is a multidimensional issue. It involves technical aspects of care, financial aspects of care, chairside manner of the health provider, waiting times for appointments and in the office, and so on. Owing to the limited number of items that any one agency can place on a SSC survey, we were unable to probe this issue more extensively. We recommend that a future survey focus on these specific components of quality of care in order to determine precisely where military families are satisfied or dissatisfied with the services they receive under the ADDDIP. Such knowledge should help program managers improve the receptivity of military families to dental insurance.

We believe our data suggests that some of the dissatisfaction or ambivalence toward the ADDDIP centers on the limited range of services covered by the plan. This is supported by the evidence that enrollment was driven mostly by limited access to available care in military dental clinics and that a majority of all military families indicated a willingness to pay extra for expanded benefits.

Because so many military families expressed a willingness to pay for expanded benefits, we believe the recent decision by Congress to expand coverage under the ADDDIP will be well received. Yet, less than a majority of insurance eligibles we surveyed were

willing to pay the \$10 more per month premium increase that Congress authorized. However this might be an artifact of the way the question was worded. Given a choice to indicate how much extra they would be willing to pay for better services, some people would choose the lowest amount listed even if they were willing to pay more than that.

Ideally, the questions on cost would have been linked to the benefits gained. For instance, we might have asked: "Would you be willing to pay \$10 more a month for a comprehensive dental insurance plan where preventive care involves no co-payment, routine care involves 20% co-payment, and expensive procedures (crowns, braces, root canals, and gum surgery) involves 50% payment?" A thorough questionnaire would involve asking several options and could be fairly complicated due to differing levels of co-payments, deductibles, and coverage limits. It should be designed with the assistance of someone knowledgeable about dental insurance benefit packages. Again due to limited number of questions we could expect to place on the SSC survey, we were unable to probe this issue more extensively.

Our recommendation would be to encourage the Department of Defense to utilize the full authorized premium increase in order to develop a comprehensive dental insurance plan. We believe this would have the best chance of making the plan attractive to military families. Attractiveness of the plan is a key feature to its success because enrollment is voluntary.

We would further recommend the development of different cost sharing structures for officers and enlisted personnel. Because officer families have more discretionary income than enlisted families, the potential for a perverse subsidization of the affluent by the less affluent exists for more expensive dental procedures. For example, if the new ADDDIP offered to cover 50% of orthodontic treatment, this may make the procedure affordable to most officer families but to few enlisted families. We suspect that much of the difference in enrollments and satisfaction with the ADDDIP across ranks seen in this study is due to income differences. Differential payment structures by rank is a longstanding military tradition in other services such as recreation and day care, and we think it would be appropriate for dental care.

The data for this study were collected in the fall of 1988, a full year after the Active Duty Dependents Dental Insurance Plan was initiated. Some may argue that our data is dated and that some of the responses we noted may have changed. Certainly enrollment in the ADDDIP has gone up, however, we doubt that change in attitudes toward the plan have been radical. Since the time of this survey, the ADDDIP has increased in cost and has had only a modest expansion of benefits. The plan now covers sealants, space maintainers, and prefabricated resin crowns for primary front teeth (2). None of these expanded benefits were high on the wish list for additional services that we documented in this survey.

Moreover, this survey is important because so little is known about the impact of the ADDDIP on military personnel. Earlier studies by Chisick and Guerin, and Chisick, Guerin, and Williams (3-5) are the only studies we know of which explore the issue.

Regrettably, a Tri-Service survey of the ADDDIP has never been done. Although we believe some of our findings would be similar across the services, we cannot really say for sure. Therefore, we endorse the decision by Congress which calls for a survey of military medical and dental benefits by December 1992(6). We recommend that the survey have a lengthy enough dental component to adequately assess the multidimensional aspects of satisfaction with quality of dental care and to evaluate trade-offs involved with the expansion of health benefits.

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ENROLLMENT IN ADDDIP BY RANK GROUP

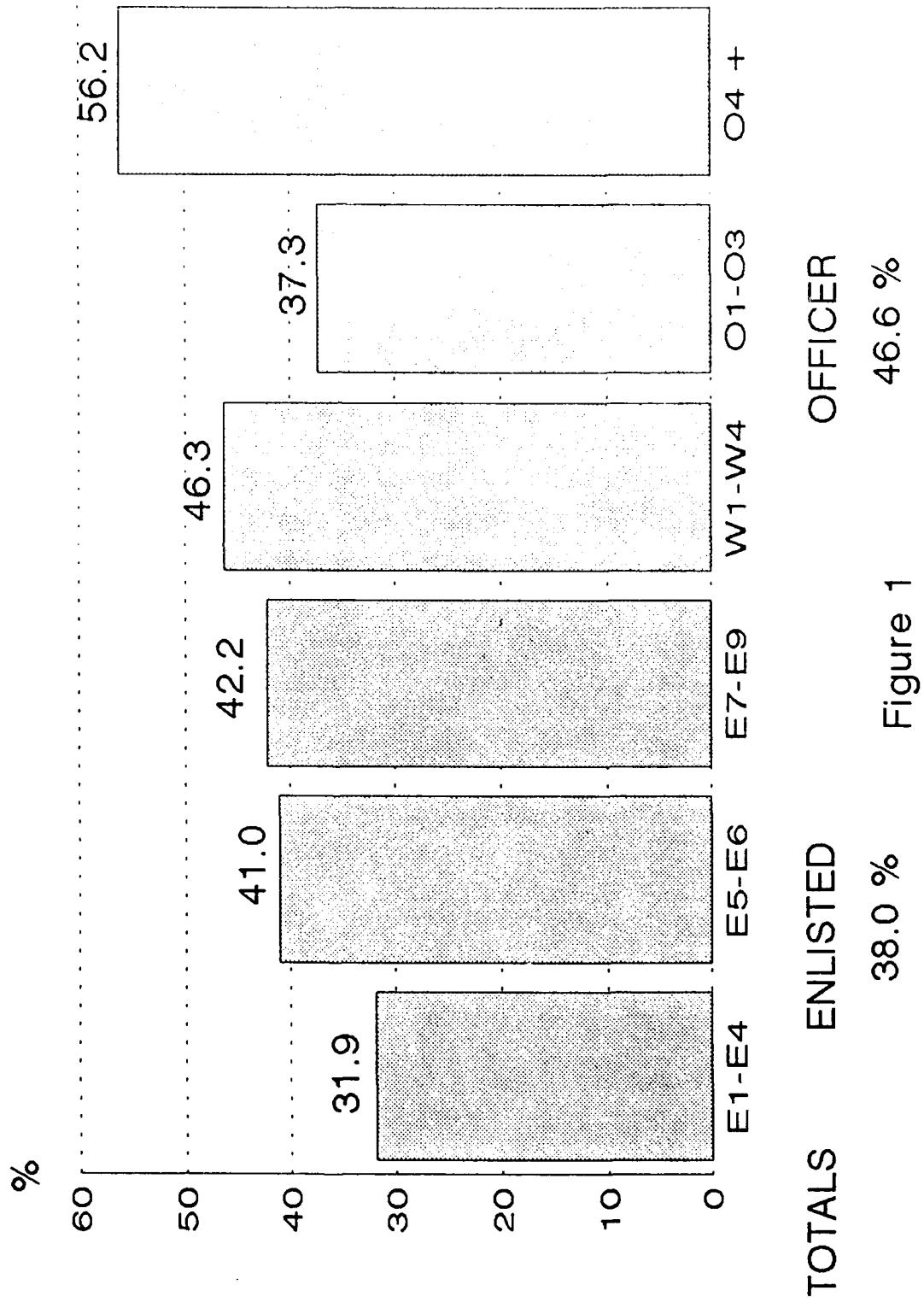


Figure 1

SATISFACTION W/QUALITY OF ADDDIP FOR ENLISTED RANK GROUPS

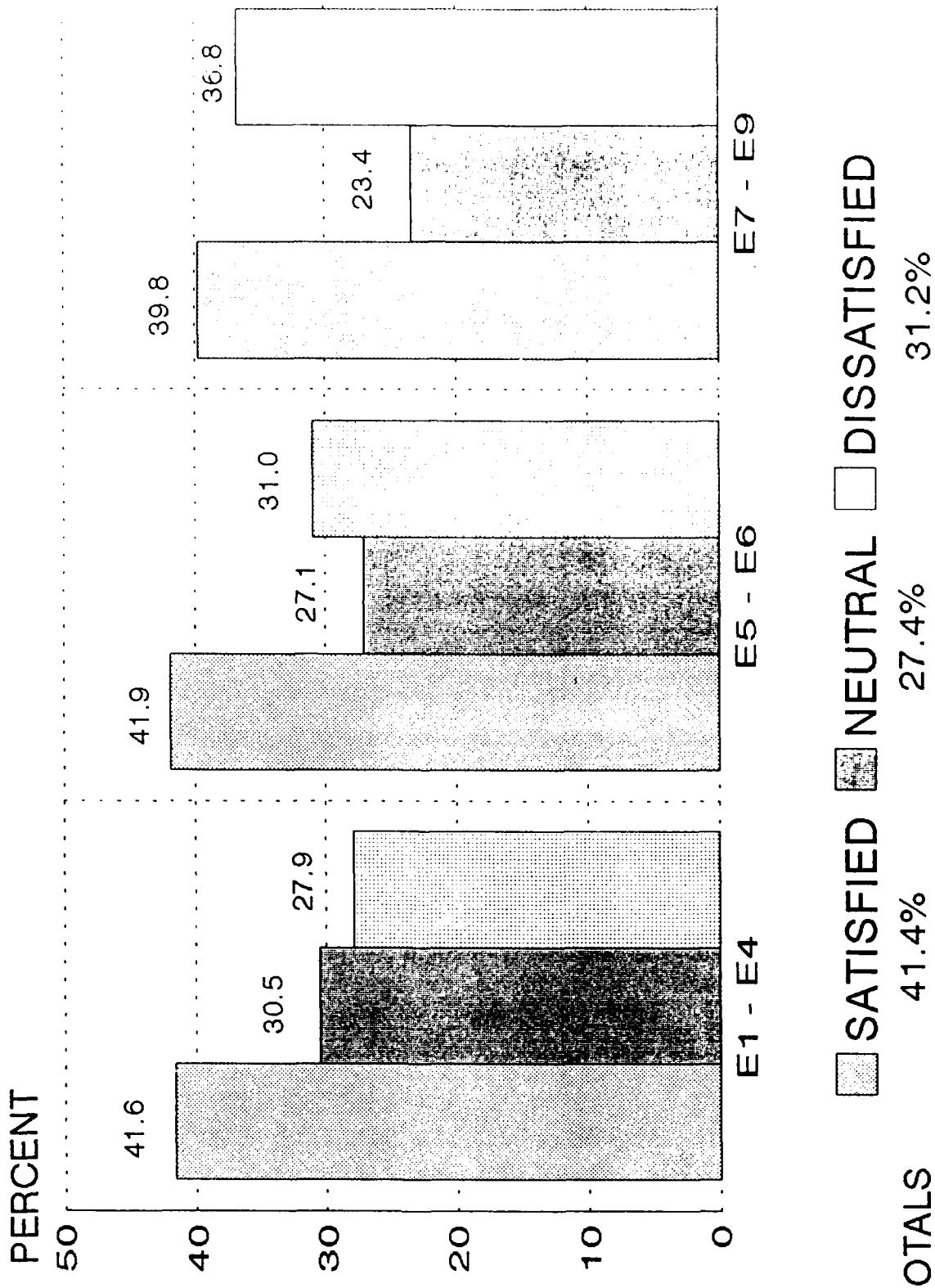


Figure 2

SATISFACTION W/QUALITY OF ADDDIP FOR OFFICER RANK GROUPS

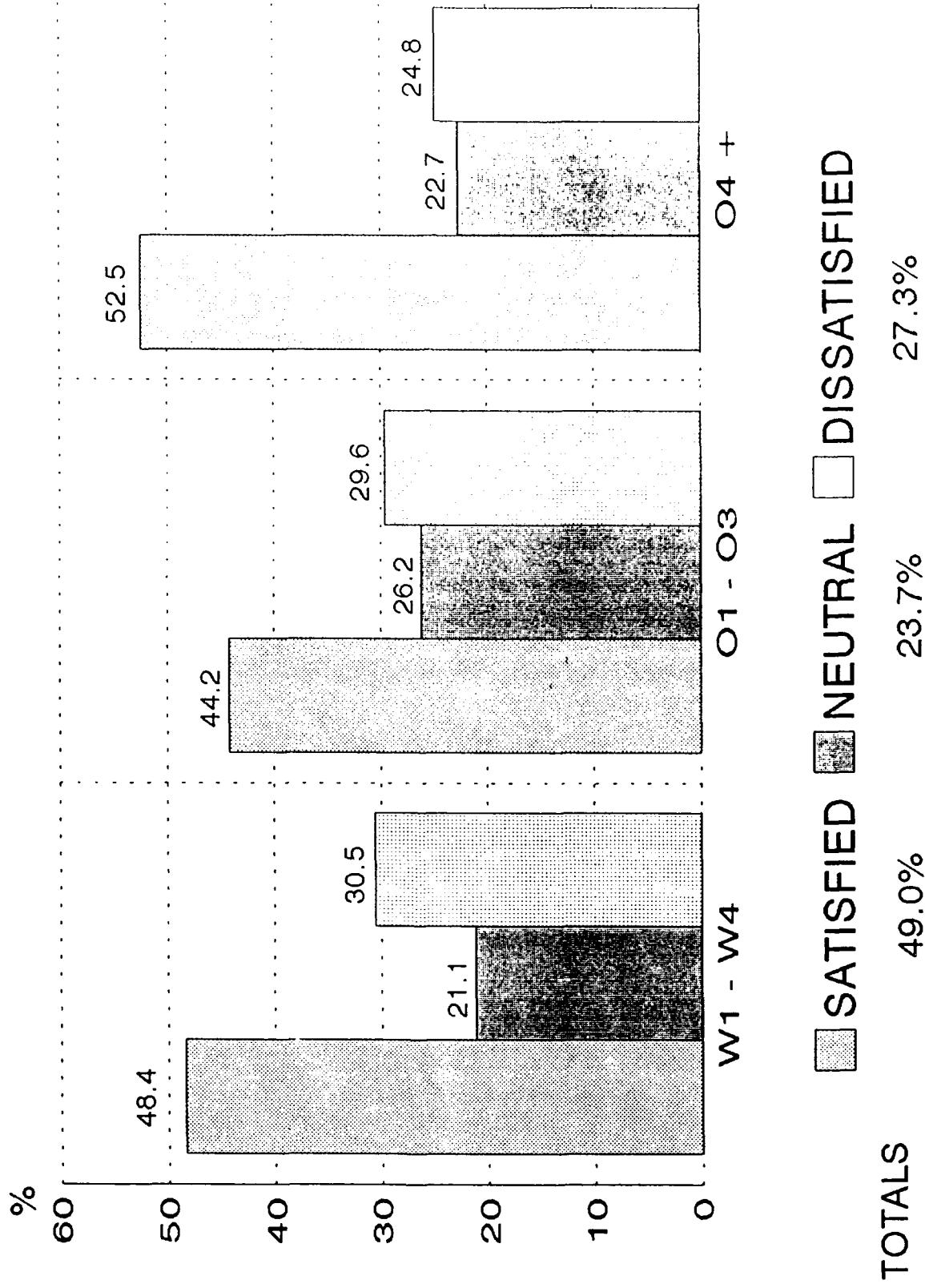


Figure 3

MOST IMPORTANT REASON FOR ENROLLED

IN ADDIP, CODE LIST

<u>CODE:</u>	<u>REASON:</u>
A =	QUEUES
B =	PREFER CIVILIAN DDS
C =	LIMITED FAMILY SERVICE
D =	CONVENIENT LOCATION
E =	FELT HAD NO CHOICE
F =	OTHER

Table 1

MOST IMPORTANT REASON ENROLLED IN ADDDIP, ALL ENLISTED

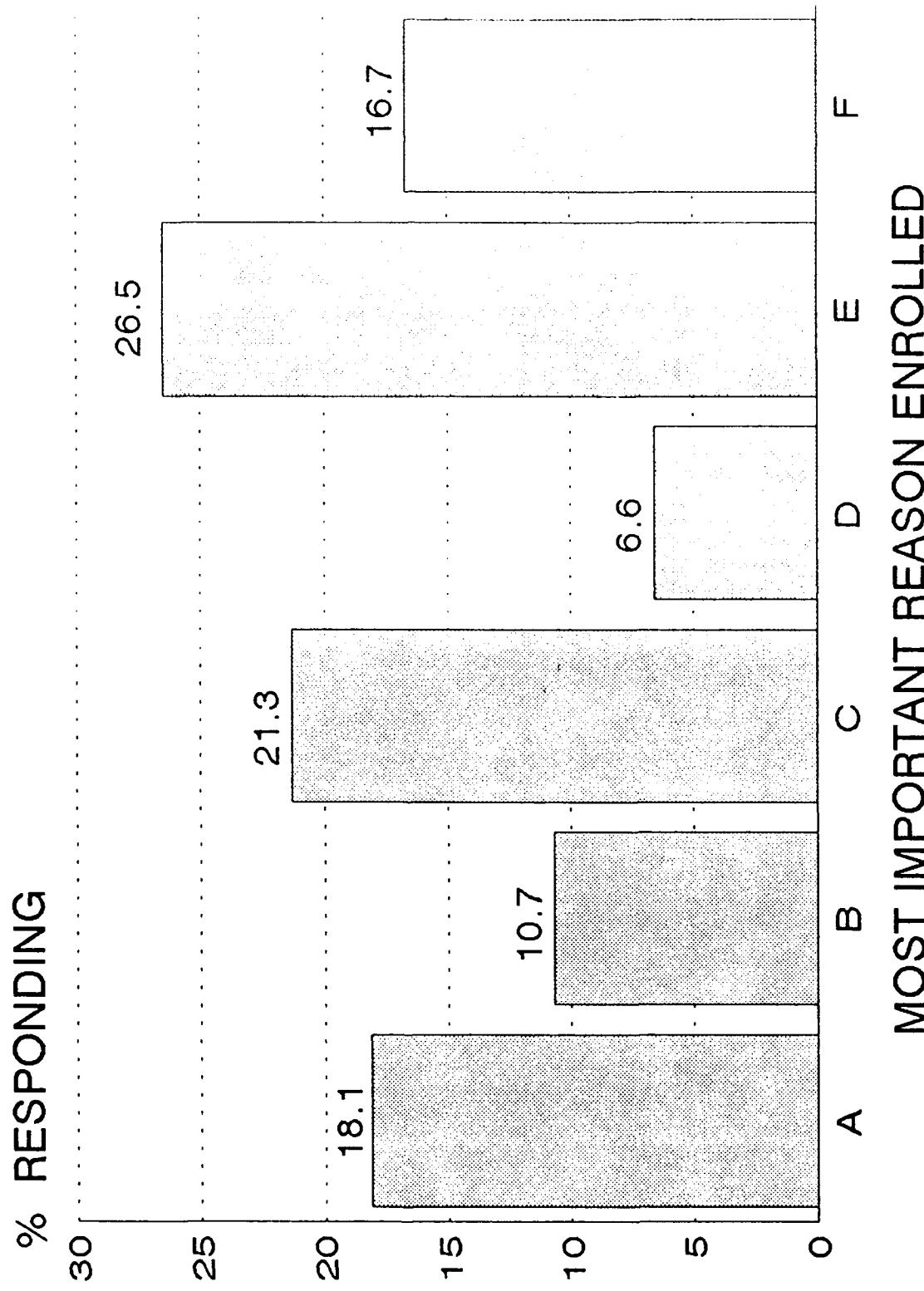


Figure 4

MOST IMPORTANT REASON ENROLLED IN ADDDIP, ALL OFFICERS

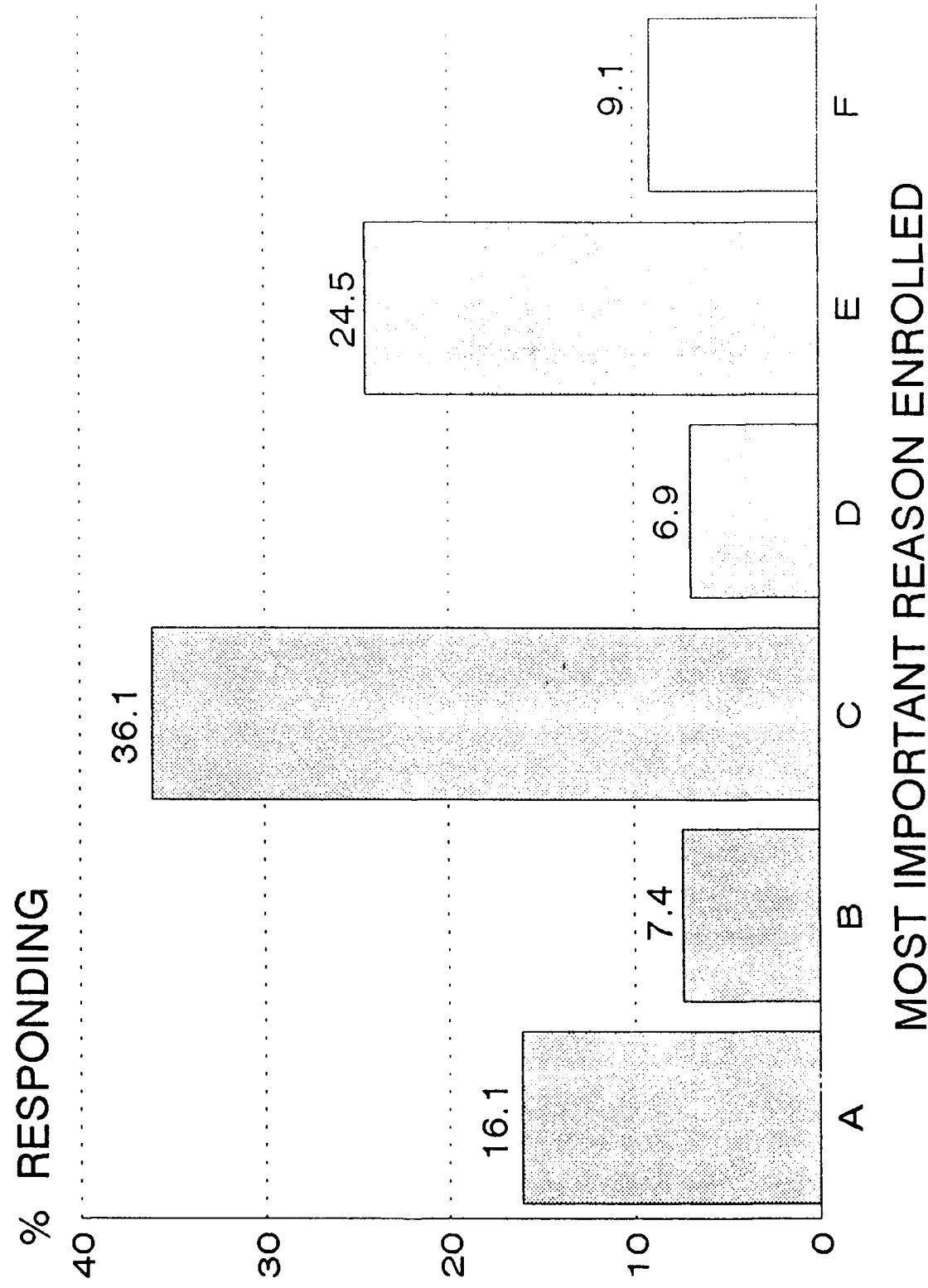


Figure 5

EXTRA \$ WILLING TO PAY FOR EXPANDED ADDIP SERVICES, ALL OFFICERS

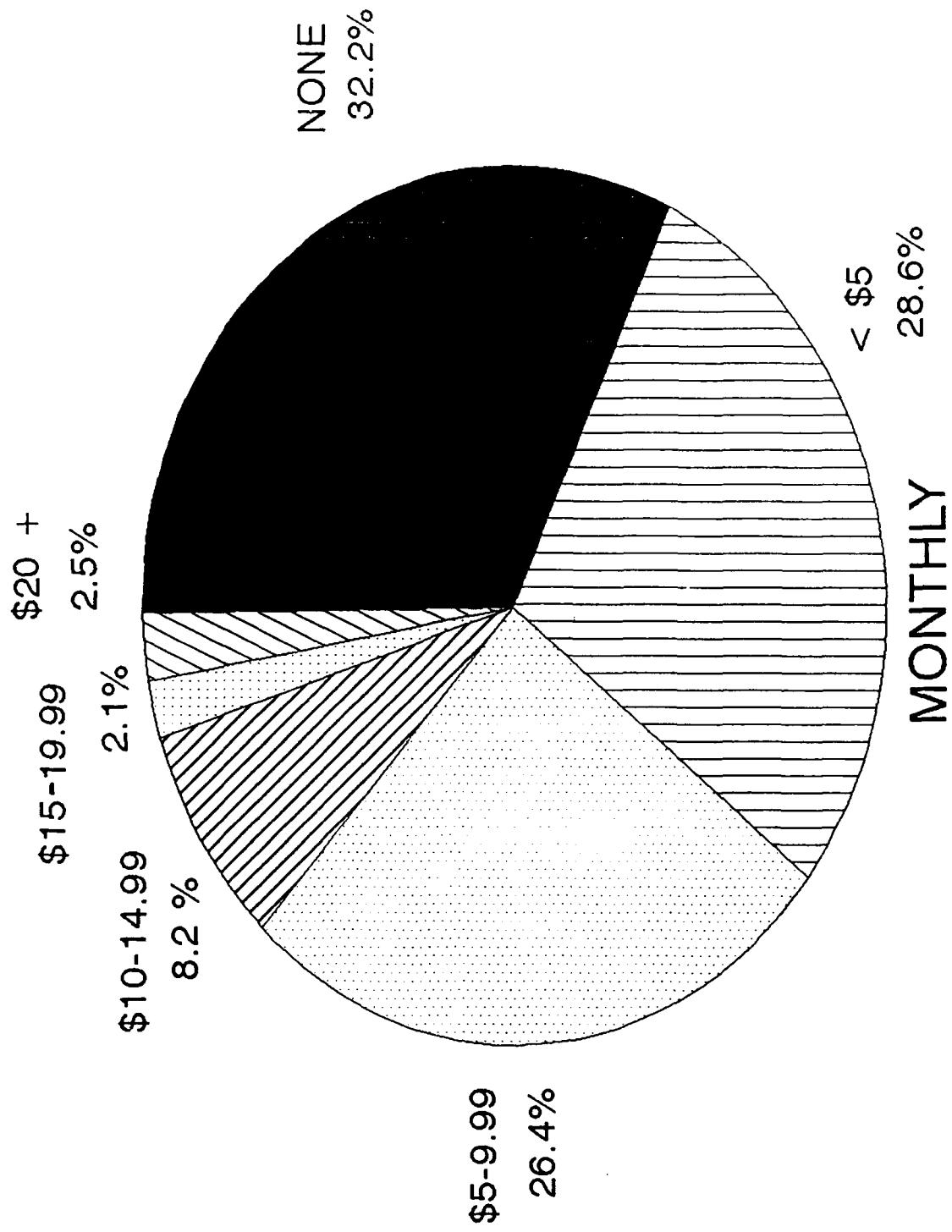


Figure 6

EXTRA \$ WILLING TO PAY FOR EXPANDED ADDDIP SERVICES, ALL ENLISTED

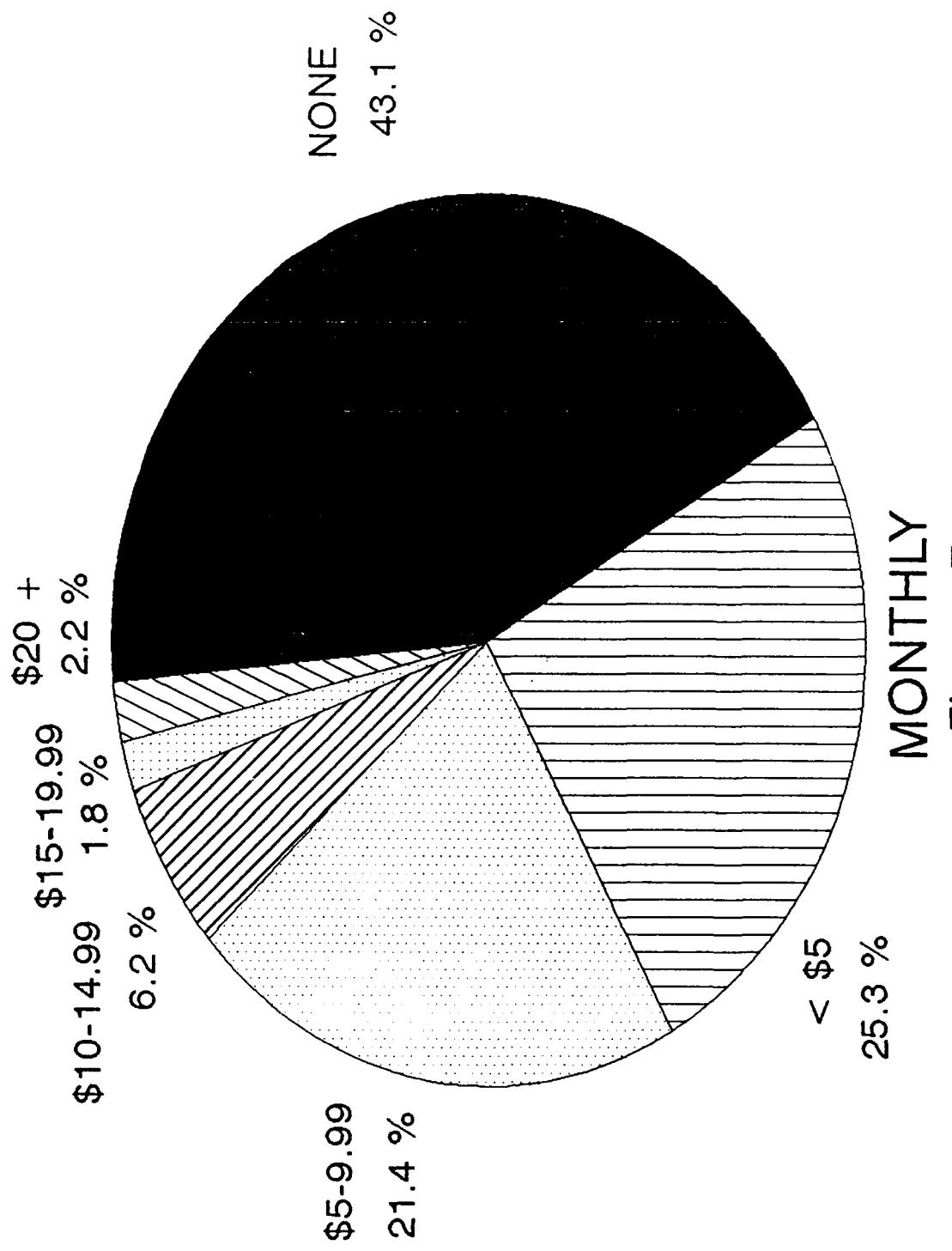


Figure 7

SERVICE MOST DESIRE INCLUDED IN ADDIP FOR ALL ENLISTED

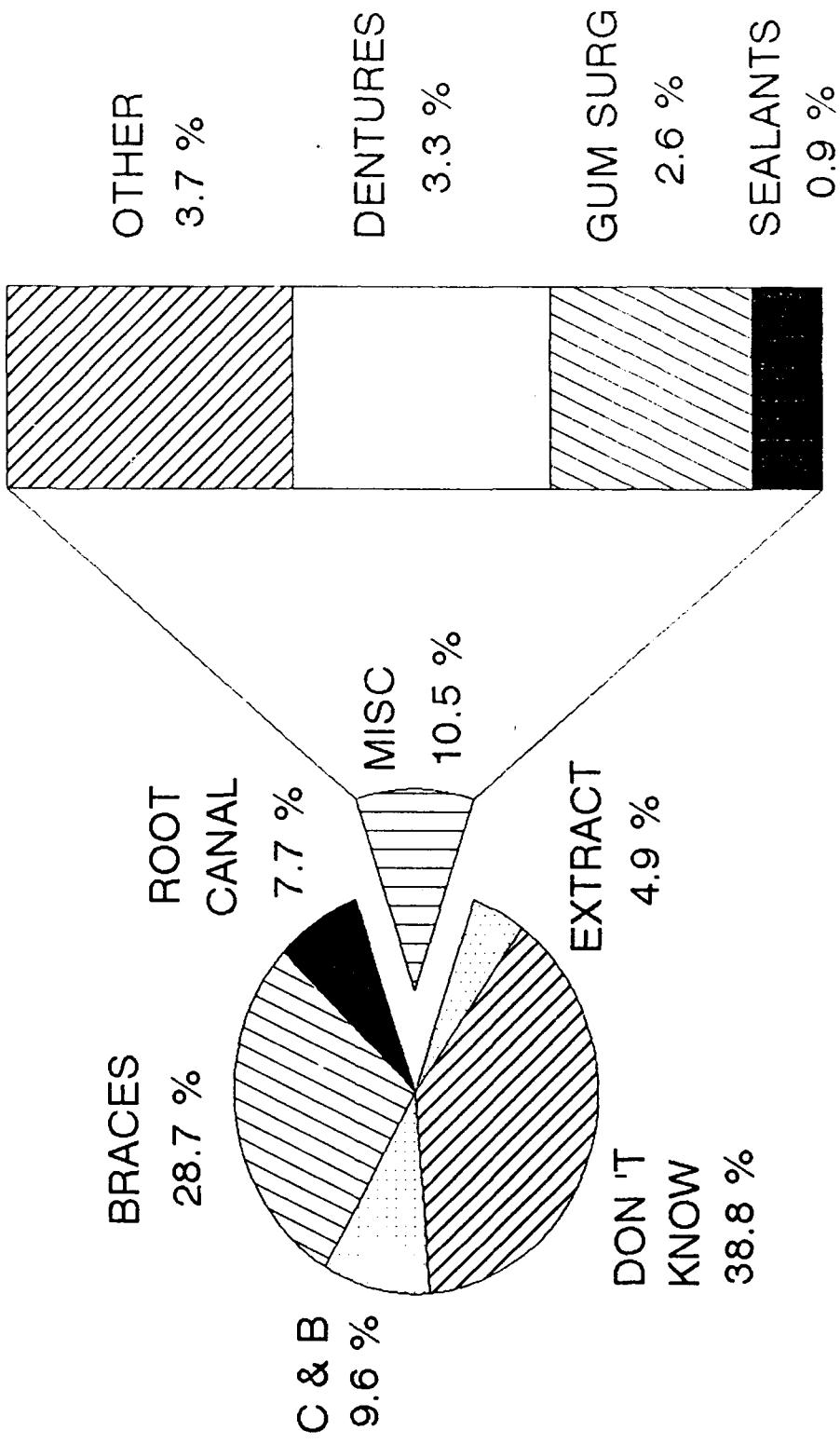


Figure 8

SERVICE MOST DESIRE INCLUDED IN ADDDIP FOR ALL OFFICERS

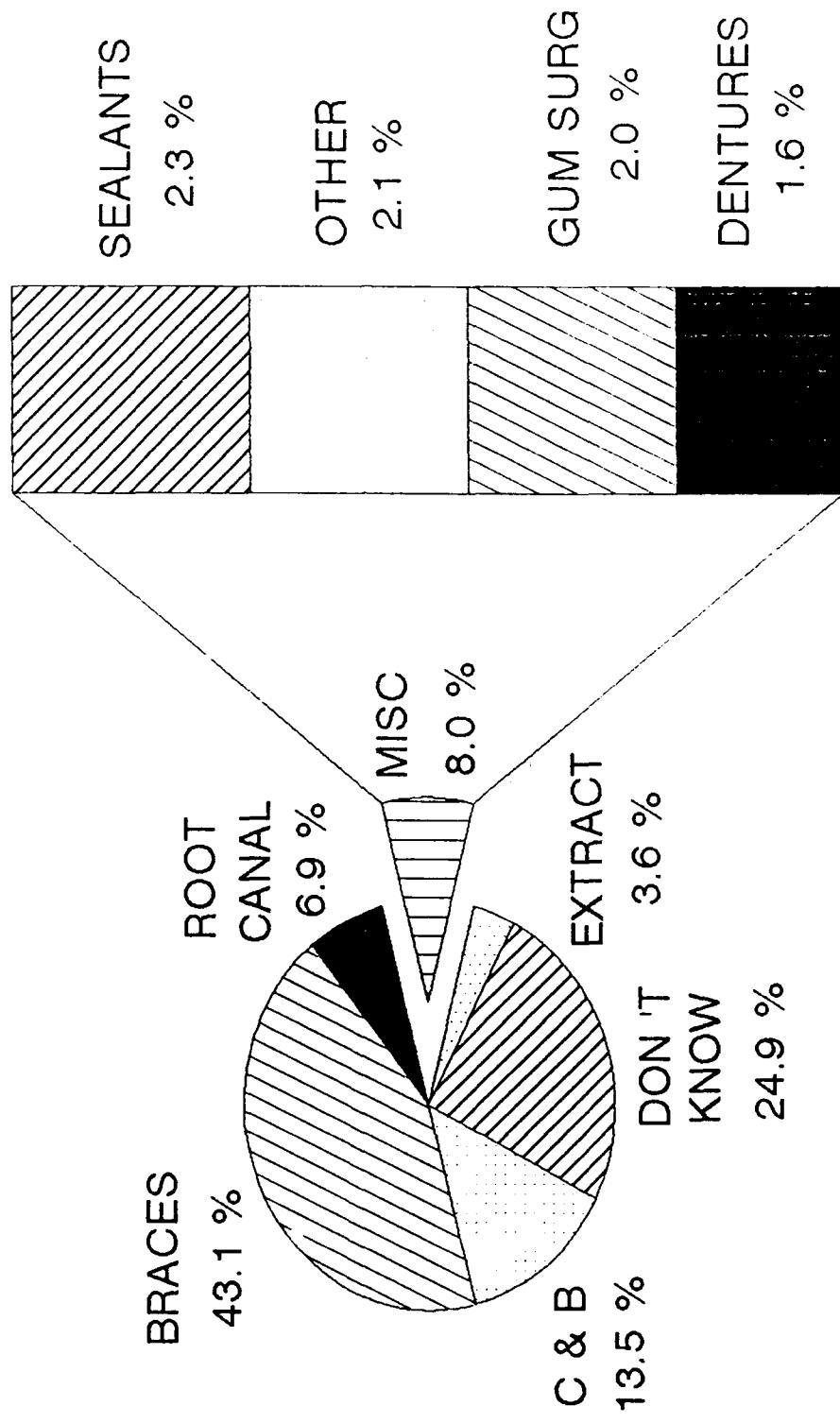


Figure 9

**Marketing and Utilization of the Active Duty
Dependent's Dental Insurance Plan**

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Abstract

Based on a random, representative sample of 2,733 officer and 7,938 enlisted Army enrollees in the Active Duty Dependent's Dental Insurance Plan (ADDDIP), we found that soldiers turned to many sources to learn about the plan and that oral sources were consulted more commonly than written sources. More than 40% of Army enrollees have never used the plan. Officer's dependents have used the ADDDIP to a fuller extent than enlisted dependents. Over half of Army enrollees felt program enrollment should be renewed automatically. The best-liked features of the ADDDIP included good cost-value, known services covered, and access to a single family dentist.

Introduction

In the summer of 1989, declining enrollments in the Active Duty Dependents Dental Insurance Plan (ADDDIP) prompted the House Armed Services Committee to voice concern that "inadequate marketing" might be adversely affecting the program (1). This concern prompted us to conduct a marketing survey of the ADDDIP in the spring of 1990. Marketing research typically focuses on the process by which people make decisions.

Although previous Army studies on the ADDDIP explored enrollment demographics or satisfaction with the benefit package (2-5), no studies have investigated the way military families learned about the ADDDIP in order to make their enrollment choice or the extent to which enrollees have used the program. According to Bandura's "social learning theory", consumers shape attitudes and behaviors largely based on communication with other people and through contact with the mass media (6). Drawing on this theory, we drafted questions to probe how Army enrollees evaluated the ADDDIP. We also solicited enrollee recommendations on how re-enrollment should be managed, where would be the most convenient source to obtain information on the plan, what are the best-liked features of the ADDDIP, and to what extent Army enrollees have used the plan. Insights from this study suggest ways that marketing of the ADDDIP can be improved.

Methods

In the spring and fall of every year, the Army Personnel Survey Office, U.S. Army Research Institute for the Behavioral and Social Sciences conducts a Sample Survey of Military Personnel worldwide. Approximately 10% of officers and 5% of enlisted personnel are selected to participate. Samples are selected from the Army Standard Installation/ Division Personnel System using the last two digits of the service member's social security number selected randomly for each survey. For the spring 1990 survey, 3,705 officers and 13,555 enlisted soldiers returned completed questionnaires, representing a 56.5% and a 68.4% response rate, respectively.

For our analysis, we limited the sample to a subset of respondents--those with dependents enrolled in the ADDDIP. Eliminating all single personnel without dependents, all childless, married personnel with active duty spouses, and all personnel stationed outside the fifty U.S. states reduced our sample to 2,733 officers and 7,938 enlisted personnel. Sample size for each survey question may vary due to non-response.

We tested for statistical differences in response to the survey questions between officer and enlisted personnel using the Chi-square test. Tests were done at both the 0.05 and 0.01 level of significance. It should be noted that for multiple response questions, the Chi-square test applies to the overall distribution of responses rather than to each level of response. Analyses were completed using the Statistical Package for the Social Sciences

(SPSS-X) .

Results

Table 1 presents responses, by rank group, to the marketing survey. Below each response, in parentheses, is the standard deviation for the 95% confidence interval. Due to the relatively large sample size, each estimate has a narrow confidence band.

Because the confidence intervals were so tight, nearly all survey responses showed statistically significant differences between officers and enlisted personnel. All but two survey questions were statistically significant at the 95% confidence level and all but four at the 99% confidence level.

As is illustrated by this data, with a large sample, even a very small difference between two groups may turn out to be statistically significant. When this occurs, the data should be closely scrutinized to determine whether observed differences are of any practical importance. Only six practically significant differences emerge: 1) Officers (59.9%) are more likely to consult their spouses concerning enrollment in dental insurance than enlisted personnel (45.3%), 2) Enlisted personnel (34.4%) are more likely than officers (16.2%) to turn to their chain of command for information about the ADDDIP, 3) Officers (43.8%) are more likely than enlisted personnel (35.6%) to consult posters or brochures to learn about the ADDDIP, 4) Officers (21.4%) are more likely to read the Evidence of Coverage booklet to answer questions about the ADDDIP than enlisted personnel (14.9%), 5) Enlisted personnel

(6.5%) are more likely to ask special unit counselors about the ADDDIP than officers (1.6%), and 6) It is more likely that an officer's dependents (37.1%) are using the insurance plan to the fullest extent than an enlisted person's dependents (26.3%).

In addition to these differences, the following four common areas of strong agreement should be noted: 1) The most common sources (55-58%) consulted to learn about the ADDDIP were the finance office, CHAMPUS health benefits advisor, and personnel office, 2) Two-thirds or more of officers and enlisted personnel considered the CHAMPUS health benefits advisor and the Army dental clinic as the most convenient place to go for information on the ADDDIP, 3) A majority of ADDDIP enrollees (55-57%) felt program enrollment should be renewed automatically, and 4) The top three best-liked features of the ADDDIP (accounting for 60% or more of responses) included: a) know services covered, b) family can get care from one dentist, and c) good cost-value.

Discussion

This survey was conducted in 1990, three years after the Active Duty Dependents Dental Insurance Plan became operational. By that time, the original basic plan, which had covered dental examinations, oral prophylaxes, and non-cast restorations, had been expanded slightly to include sealants and stainless steel crowns for children. Premiums had increased from \$3.93 per month to \$7.86 per month for one dependent and from \$7.86 per month to \$9.42 per month for two or more dependents.

Results from this survey show that Army enrollees in the ADDDIP consulted many sources in reaching their enrollment decision. However, not all of these sources carried equal weight. Oral sources were consulted more frequently than written sources. Officers were more likely than enlisted personnel to consult written sources and, also, to consult their spouses about enrollment decisions. The former finding may be due to the relative ease of using an oral reference as opposed to a written one, while the latter one may be due to socio-cultural differences between officer and enlisted personnel. That the finance office, CHAMPUS health benefits advisor, and personnel office were most frequently consulted is not surprising. After all, administrative responsibility for the ADDDIP rests with a post's finance office.

The level of consultation with spouses by service members, especially among officer personnel, suggests that marketing of the ADDDIP should be aimed at both the sponsor and the spouse. Concentrating on the sponsor only misses a key player (spouse) in the decision making process for family dental care in many military households.

The relatively frequent consultation of friends suggests that expanded enrollment in the ADDDIP will, in part, be determined by satisfaction of current enrollees. It also suggests a marketing strategy featuring testimonials of satisfied enrollees. These testimonials should highlight characteristics enrollees like best about the ADDDIP such as cost-value, ability to get family care by one dentist, and consistent family access to basic dental care

regardless of assignment location. The latter is especially important to junior enlisted personnel assigned overseas or to high cost of living areas in the U.S. It is not uncommon for these soldiers to have their dependents live with relatives far away from a military installation.

The two sources-- Army dental clinics and the CHAMPUS health benefits advisor-- that were cited as the most convenient place to get information on dependent dental insurance are closer to providers of health care than purely administrative sources. Personnel, finance, or orderly room staff may be too unfamiliar with specifics of the ADDDIP or may be regarded as too impersonal in addressing soldier's inquiries about the ADDDIP. Respondents appear to be saying that they would prefer that questions about how dependent dental insurance works should be handled by individuals with some knowledge of the delivery of dental care.

Although a majority of Army enrollees favor automatic re-enrollment, a significant proportion of respondents do not. Clearly, automatic re-enrollment would be easiest for enrollees and administrators. However, without periodic review, enrollees may be unaware of changes in the benefits package which may influence their utilization of the plan or their enrollment choice. Perhaps this could be addressed by noting changes in the plan on the soldier's leave and earnings statement.

To us, it is perplexing that 40% or more of Army enrollees in the ADDDIP have never used the plan. To voluntarily enroll and pay the monthly premium but not take advantage of services covered 100%

by the plan (examinations and teeth cleanings) seems unusual, however non-utilization rates of 40% or better have been documented in other insured populations (7-16).

The utilization rate seen in this sample (59.9% for officer and 57.9% for enlisted families) compares favorably to that found in civilian insured groups (46% to 68.7%) (7-16). Several civilian studies have revealed marked differences in dental utilization across socioeconomic status (12-16). This may explain the observed differences in utilization between officer and enlisted personnel in our study. Perhaps there are some access barriers such as not being able to find a suitable dentist who participates in the plan, fear of the dentist, or other uncertainties about seeking non-military dental care that keeps some enrollees from using the ADDDIP. Factors related to non-use of dental services by Army enrollees should be further explored, and the government should encourage enrollees to make use of the plan's preventive services in order to keep long-run costs of the program low.

Recently, Congress appropriated \$50 million to expand ADDDIP benefits in April 1993. The expanded plan will include the following services not covered under the current plan: wisdom teeth extractions, root canals, crowns, bridges, dentures, gum surgery, and braces. Premiums will increase to about \$20 per month with co-payments ranging from 20-50% depending on the procedure (17).

We anticipate that these improvements will enhance plan enrollment because they will solve two major problems with the current ADDDIP. First, in previous studies, Army families have

identified limited coverage as a major reason for not enrolling in the ADDDIP and have expressed a willingness to pay more for expanded ADDDIP benefits (3-5). Second, limited coverage has forced many ADDDIP enrollees into seeking care for non-covered services at military dental clinics, thereby fragmenting family dental care. In a 1989 survey of Army ADDDIP enrollees, 63.2% and 56.9% of officer and enlisted families, respectively, considered fragmented family dental care to be a problem (18).

However, to maximally enhance ADDDIP enrollment, ADDDIP program managers must not only solve deficiencies in the benefits structure. They must also market the plan. ADDDIP managers would benefit by applying the findings outlined in this report and by conducting periodic marketing surveys similar to this one in order to better service military families.

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TABLE 1

Comparison of Responses to Marketing and Utilization Questions
 About the Active Duty Dependents Dental Insurance Plan
 Between Officer and Enlisted Personnel

<u>Question</u>	<u>Officers</u>	<u>Enlisted</u>
Who participated in the enrollment decision?	n= 2470	n= 6419
.....service member only	37.8% (1.9%)#	49.3% (1.2%)
.....service member & spouse	59.9% (1.9%)	45.3% (1.2%)
.....spouse only	2.2% (0.6%)	5.4% (0.6%)

$$X^2 = 166.76 **$$

Which of the following sources of information did you consult to learn about the ADDDIP?

.....finance office, CHAMPUS health benefits advisor, or personnel office	n= 1621	n= 2703
	54.9% (2.4%)	58.3% (1.9%)

$$X^2 = 4.79 *$$

.....newspapers or magazines	n= 1612	n= 2710
	24.2% (2.1%)	24.7% (1.6%)

$$X^2 = 0.13$$

.....NCO or commanding officer	n= 1604	n= 2685
	16.2% (1.8%)	34.4% (1.8%)

$$X^2 = 166.51 **$$

TABLE 1 (cont.)

Comparison of Responses to Marketing and Utilization Questions
 About the Active Duty Dependents Dental Insurance Plan
 Between Officer and Enlisted Personnel

<u>Question</u>	<u>Officers</u>	<u>Enlisted</u>
.....posters or brochures	n= 1604	n= 2700
	43.8% (2.4%)	35.6% (1.8%)
	$\chi^2 = 28.79 **$	
.....friends	n= 1599	n= 2686
	29.5% (2.2%)	35.0% (1.8%)
	$\chi^2 = 13.61 **$	
For questions about the ADDDIP, who would you turn to?	n= 1617	n= 2771
.....Delta dental, the insurer	21.2% (2.0%)	20.3% (1.5%)
.....the Evidence of Coverage book- let given to plan members	21.4% (2.0%)	14.9% (1.3%)
.....special counselor in unit	1.6% (0.6%)	6.5% (0.9%)
.....civilian dentist in the plan	7.0% (1.2%)	6.9% (0.9%)
.....Army dental clinic	27.4% (2.2%)	31.9% (1.7%)
.....Personnel office, finance office or CHAMPUS advisor	21.5% (2.0%)	19.4% (1.5%)
	$\chi^2 = 86.36 **$	

TABLE 1 (cont.)

Comparison of Responses to Marketing and Utilization Questions
 About the Active Duty Dependents Dental Insurance Plan
 Between Officer and Enlisted Personnel

<u>Question</u>	<u>Officers</u>	<u>Enlisted</u>
Where would be the most convenient place for you to go for information on the ADDDIP?	n= 1611	n= 2767
.....military personnel office	9.3% (1.4%)	7.3% (1.0%)
.....finance office	2.5% (0.8%)	4.1% (0.7%)
.....CHAMPUS health benefits advisor	33.0% (2.3%)	34.3% (1.8%)
.....unit orderly room	10.1% (1.5%)	11.6% (1.2%)
.....Army dental clinic	37.5% (2.4%)	36.2% (1.8%)
.....other	7.7% (1.3%)	6.3% (0.9%)

$\chi^2 = 18.54 **$

TABLE 1 (cont.)

Comparison of Responses to Marketing and Utilization Questions
 About the Active Duty Dependents Dental Insurance Plan
 Between Officer and Enlisted Personnel

<u>Question</u>	<u>Officers</u>	<u>Enlisted</u>
Which one feature do you like best about the ADDDIP?	n= 1541	n= 2702
.....know services covered	19.3% (2.0%)	22.0% (1.6%)
.....easy to make appointments	12.4% (1.6%)	11.3% (1.2%)
.....family can get care from one dentist	21.4% (2.0%)	26.4% (1.7%)
.....convenient appointment times	9.8% (1.5%)	5.2% (0.8%)
.....good cost value	24.3% (2.1%)	22.6% (1.6%)
.....civilian dentists treat my family with respect	12.9% (1.7%)	12.5% (1.2%)

$$X^2 = 45.49 **$$

How should program enrollment be renewed?	n= 1598	n= 2725
.....by choice at in-processing	21.8% (2.0%)	25.1% (1.6%)
.....by choice every two years	21.1% (2.0%)	19.4% (1.5%)
.....automatically unless requested otherwise	57.1% (2.4%)	55.5% (1.9%)

$$X^2 = 6.57 *$$

TABLE 1 (cont.)

Comparison of Responses to Marketing and Utilization Questions
 About the Active Duty Dependents Dental Insurance Plan
 Between Officer and Enlisted Personnel

<u>Question</u>	<u>Officers</u>	<u>Enlisted</u>
Have any of your dependents used the ADDDIP?	n= 1739	n= 2770
.....none	40.1% (2.3%)	42.1% (1.8%)
.....some	22.8% (2.0%)	31.6% (1.7%)
.....all	37.1% (2.3%)	26.3% (1.6%)

$$X^2 = 71.59 **$$

Have your dependents used the ADDDIP for dental care other than examinations and teeth cleaning?	n= 1627	n= 2693
.....yes	40.6% (2.4%)	38.2% (1.8%)
.....no	59.4% (2.4%)	61.8% (1.8%)

$$X^2 = 2.49$$

parentheses contain standard deviation for 95% confidence interval

* Significant at 95% confidence level

+ Significant at 99% confidence level